The Builder.

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Wooden Architecture of Norway.

HOUGH Norway has recently become a great resort for holiday-makers from this country, yet it may be doubted whether the country itself and its institutions are much better known to the English visitor than they were twenty years back; and this is more especially the case in regard to architecture, as the inhabitants on a beaten "tourist" track soon lose their individuality; their picturesque homes make way for the lodging-house and hotel; their monuments and places of worship are "modernised" with the stranger's money, and even their institutions are gradually changed or only artificially kept up to please foreign visitors. For those visitors to Norway who wish to leave the beaten track, and see something more of the indigenous architecture of the country districts, we may recommend an interesting volume lately published at Berlin,* "Die Holzbaukunst Norwegens," of which Messrs. Dietrichson and Munthe are the joint authors. Dr. L. Dietrichson is one of the Professors at the Christiania University and the leading authority on Norwegian archæology. Mr. H. Munthe is one of the architects to the Christiania Board of Works, whose private practice has lately been considerably increased by the frequent commissions of the German Emperor, whose new châlets, boathouses, &c., are apparently now all to exhibit the Norse style.

"Die Holzbaukunst Norwegens" contains some hundred and fifty pages of well-written text, illustrated with about two hundred carefully-executed woodcuts, as well as some good full-page photo-lithographs. The book is divided into two main parts, treating respectively of the ancient and the modern architecture of the country; the first part being again divided into a chapter on church work, and another on utilitarian erections. The section on modern architecture is practically only a series of illustrations representing work by the leading architects of modern Norway, and its text is of minor importance. In the first part both text and illustrations merit equal attention.

Chapter I. of the first part has the heading "Stabkirchen," and is practically an abbreviated German translation of Dr. Dietrichson's "De Norske Stavkirker." This standard Norwegian work was essentially an archæological chronicle of everything referring to the three hundred wooden churches the country could at one time boast of. In the German chapter the author, however, writes more popularly and with less detail, and gives precedence to the still existing monuments. Their number is, unfortunately, now but small, practically only some two dozen, and these are spread all over the country, especially in the inland province of Hamar; but for all that, though the usual tourist's track will often have to be left, even the most distant of them are tolerably accessible off the Christiania-Throndhjem Railway. In 1884 some few were, strange to say, removed from their original positions, and are now to be found at more convenient places near Christiania, Bergen, and Throndhjem. There the less enterprising tourist can go over well-preserved specimens at the price of sixpence each, and hear all particulars from a "guide" in return for the usual gratuity. Of course, the Christiania Museum and other Norwegian collections also contain a number of pieces from the buildings which have disappeared, and many of the churches which were re-erected in stone contain some memento of their predecessors; but these exhibits are but a poor substitute for the complete originals, where the picturesqueness of the general effect was the main attraction. However interesting the detail may be in a certain sense, and however much we may sometimes admire its excellent technique, the coarseness, not to say vulgarity, of the design is often so predominant when we examine an individual piece of the work closely that we are disappointed. To enjoy the effect of a Norwegian wooden church, the spectator should stand a hundred yards off. He should also not see the carefully-prepared specimen in the suburb of a town, but those which stand in their natural surroundings, in hilly country, far away from railways, and, if possible, with a group of the native population in their picturesque costumes close at hand.

Intending visitors should note the following list of wooden churches yet to be seen in their original positions. There are two at Grip and Kvernes, both near the coast in the Nordmöre district of the Province of Throndhjem; the Rödven church is up one of the fiords in the Romsdal district of this province. In the Sogne district of the Province of Bergen there are churches at Urnes, Borgund, Hopperstad, and Kaupanger. All four are situated far up the Sogne Fiord, quite a hundred miles from the sea. The Röldal Church, up the Hardanger Fiord, is in a district of the same name in the Province of Bergen. The churches at Hitterdal and Eidsborg in the Thalemark district are the only two remaining in the Province of Christiansand. They are situated due west of Christiania, half way between the capital and the west coast. The Province of Christiania has some specimens at Nore, Opdal, and Torpe. The first two are in the Numedal district, the latter in Hallingdal. All the five buildings last mentioned are well inland, and hence less easily accessible than the others. The Province of Hamar has seven churches. Five of these are in the Valdres district, at Hedal, Reinli, Hegge, Lomen, and Hurum; two in the Gudbrandsdal district, at Lom and Ringebu. These are the most difficult to get at, as they require much driving and walking to reach them. The most important buildings on this list are those at Hitterdal, Borgund, Urnes, Hopperstad, Lom, and Ringebu. As their situation is also very beautiful, the student will certainly do well to visit them.

Of the buildings so conveniently transferred from their original sites, the two at Christiania and Throndhjem alone deserve attention. They were brought respectively from Guldal and Gol.

It is not our intention to enter on the historical development of the Norse churches which Dr. Dietrichson so ably describes. It will suffice to give a few particulars of the chief monuments. The Hitterdal Church has a history reaching back to 1315 A.D. The building has been much altered in the course of time, and after practically becoming a ruin, had to be throughly restored in 1849. This "restoration" having been done without a thorough knowledge of its style, its former individuality has been practically lost. The chief dimensions of the nave are 35½ ft. by 32½ ft.; the choir measures 20 ft.

* "Die Holzbaukunst Norwegens in Vergangenheit und Gegenwart." By Dr. L. Dietrichson and H. Munthe. Berlin: Schuster & Bufleb. 1894.

square; the main ridge of the church is 53 ft. above the ground; the cross in the turret is 83 ft. high. There are some excellent specimens of wood-carving on the doors.

Borgund Church, of which we give a plan (see Fig. 1), is perhaps one of the

Fig. 1.—Plan of Borgund Church.

best known, owing to its situation on the Christiania-Bergen high road. It is certainly one of the best-preserved buildings of its kind, and has not been spoilt by any injudicious restoration. It is believed to have been erected about the middle of the twelfth century, as far back as 1150, though there is no positive proof of its existence earlier than 1360. There is little doubt that some of its porches and turrets were added at a later date, but otherwise the original plan is practically undisturbed. The main dimensions of the plan are 42 ft. by 32 ft. for the nave, and 30 ft. by 24 ft. for the choir. The roof-ridge is 50 ft. above the ground.

The church at Urnes, according to Dr. Dietrichson, is supposed to have been built at the end of the eleventh century. Our plan (see Fig. 2), shows the building as it now stands, but there is little doubt that the church formerly covered more ground. It has an amount of curious barbaric carving, the design of which can in no way be compared with the refined specimens at the Hittertal Church, but its quaint emblems have furnished much matter for study to the ethnologist, and are hence of some permanent scientific value. The nave measures 28 ft. by 21½ ft. The pieces of carving

Fig. 2.
Plan of Urnes Church.

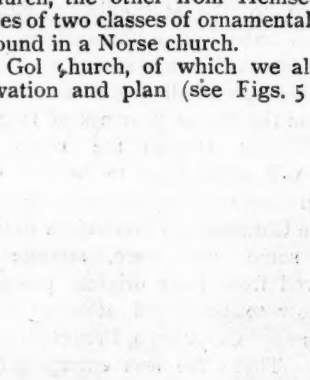


Fig. 3.—A Capital from Gol Church.

we illustrate (see Figs. 3 and 4), one from the Gol Church, the other from Hemsedal, are examples of two classes of ornamental design to be found in a Norse church.

The Gol Church, of which we also give an elevation and plan (see Figs. 5 and 6), stands, as before observed, at Throndhjem; King Oscar II. had it removed in

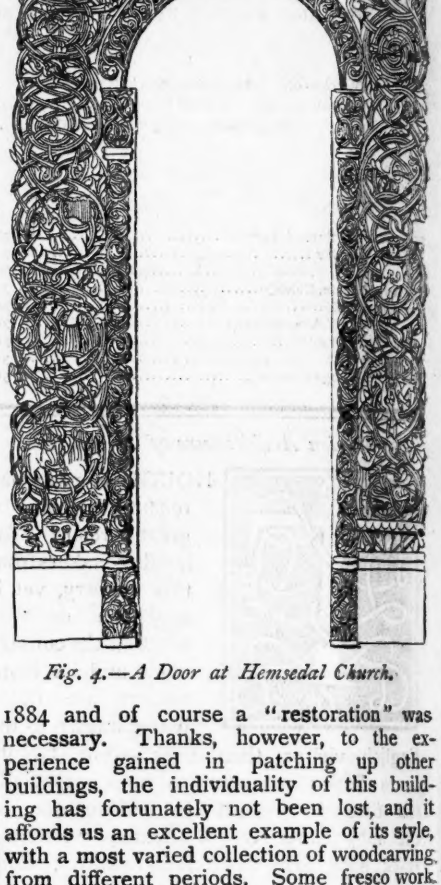


Fig. 4.—A Door at Hemsedal Church.

1884 and of course a "restoration" was necessary. Thanks, however, to the experience gained in patching up other buildings, the individuality of this building has fortunately not been lost, and it affords us an excellent example of its style, with a most varied collection of woodcarving from different periods. Some fresco work by the Norwegian peasant-painter Kinèberg,

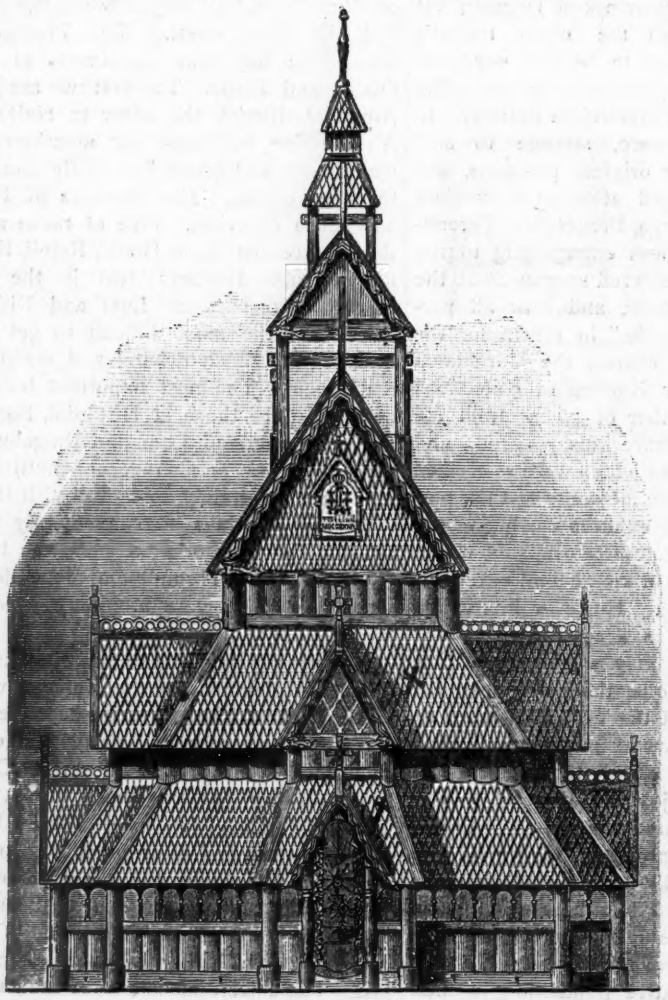


Fig. 5.—Front Elevation of Gol Church.

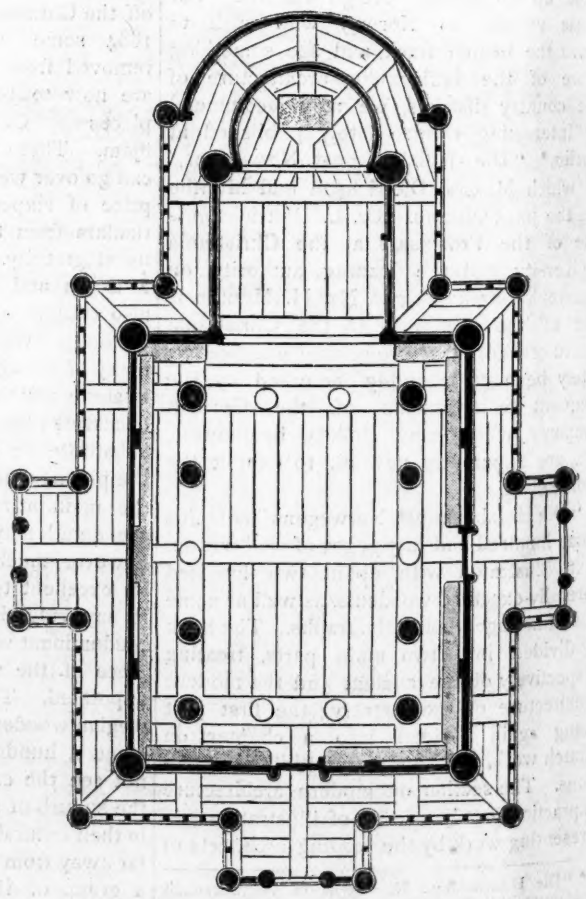


Fig. 6.—Plan of Gol Church.

dates from 1652. The "Lords Supper," the "Apostles," &c., are among the subjects treated by this rustic artist, and a comparison with the contemporary work of other countries is by no means uninteresting The dimensions of the Gol church are 25 ft. by 21 ft. for the nave, 10½ ft. by 10½ ft. for the choir, 38 ft. to the main ridge, and 62 ft. to the top of the tower.

Dr. Dietrichson's second chapter, as before remarked, treats of utilitarian buildings only. The old examples of huts, farmyards, village offices, and the like, are explained. We reproduce illustrations of some types of rural block-houses, which are quite as substantial as they are picturesque (see Figs. 7, 8, and 9). We regret not to find any re-

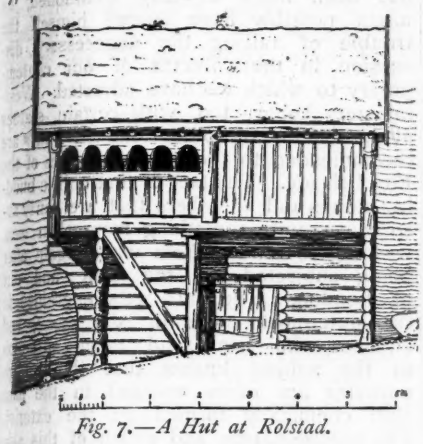


Fig. 7.—A Hut at Rolstad.

construction of the old Norwegian "chieftains'" palaces in this chapter, as it would have been interesting to see how wooden buildings were adapted for more important and elaborate requirements.

What can be done with Norse work, even to fulfil modern requirements, can be seen in the second part of the book, which treats of the Norwegian national architecture of to-day. Practically every class of building is represented, and in nearly every case we find this "renaissance" productive of very pleasing results. One of the first examples of this period was a villa at Christiania, designed by Mr. Schirmer, in 1851. A boat-house, built in 1867, from drawings of Mr. G. Bull, was the next. Other examples are shown, such as the railway station at Sandviken (1873), also by Mr. Bull, and a hotel from Mr. Thrap-Meyer's design. Previous to 1885 the revivals of the ancient style were somewhat amateurish, but since that period the revival architects have thoroughly got up the ancient style, and the work has been well done. Mr. H. Munthe, the joint author of the present book, soon became known as a specialist, and his works not only find favour at home, but also abroad. The Holmskollen Hotel, a two-story building, is a good example of the work this architect has done in his own country. This building has a frontage of about 100 ft. Its dining-room is 45 ft. long, the drawing-room 35 ft. square, and yet the details of the Norse style, generally associated with small rural buildings, do not look out of place. It lends itself excellently, of course, to country hotels and chalets; and, backed by green foliage, even looks better than our own half-timber work. Frognersaeteren, near Christiania, also illustrated in the book, though a small building, is an excellent piece of work of its kind. Of buildings Mr. Munthe has carried out in other countries, those for the German Emperor are the best known and most important. Mr. Munthe built the Emperor's boathouse at Potsdam, his new châlet at Rominten, and a church at the same place. All these are illustrated in the volume, and are, perhaps, the most interesting things among the plates showing modern work.

The Potsdam boat-house represents modern Norse architecture of the simplest kind, but the grouping of the block is picturesque, and the appearance of the building is very suitable to its purpose. The new chalet at Rominten has more elaboration; the elevation we reproduce (see Fig. 10) unfortunately does not do the building justice, as its effectiveness is to a great extent dependent on the grouping. The main outline of the block-plan is in H-shape. The centre part is lower than the wings, and contains the Emperor's reception-room; the right wing contains the Emperor's apartments, the left has those of his *suite*. The details, both inside and out, are good—the carving especially so. The Emperor's apartments on the ground floor consist of an ante-room, 20 ft. by 14 ft.; a sitting-room, 20 ft. square; with a loggia and a verandah. Off the sitting-room is the aforesaid central reception-room, which measures 40 ft. by 22 ft., and is also used as a dining-room. On the first floor is a large study, bed-room and bath-room, with a verandah. These rooms have their own staircase, and are reached by passing through an ante-room, off which there are also offices for an adjutant and a valet. The wing in which the suite has its apartments contains four rooms on the ground-floor and four on the first. There is a separate staircase, and the necessary bath-rooms and offices have been provided in duplicate. The kitchen and servants' quarters are in a roomy basement.

The church at Rominten, of which we give the plan (see Fig. 11), is an excellent

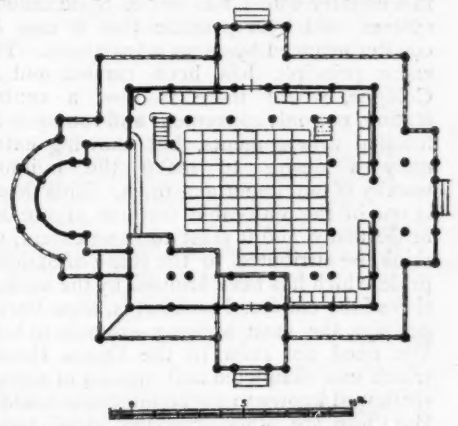


Fig. 11.—Plan of the new Rominten Church.

example of the "Norse Renaissance." The individuality of the old work is not lost, but both in plan and detail there is a marked improvement on what can be seen in Norway. The church is practically used as the Court chapel to the châlet described above, and the Emperor has hence been provided with a pew near the altar and a separate porch. This place of worship is, of course, quite a miniature one, but certainly a far more pleasing building than some of the more commonplace types of brick and stone churches frequently built in rural districts; still more is it superior to that terrible class of erection, the "temporary" iron church.*

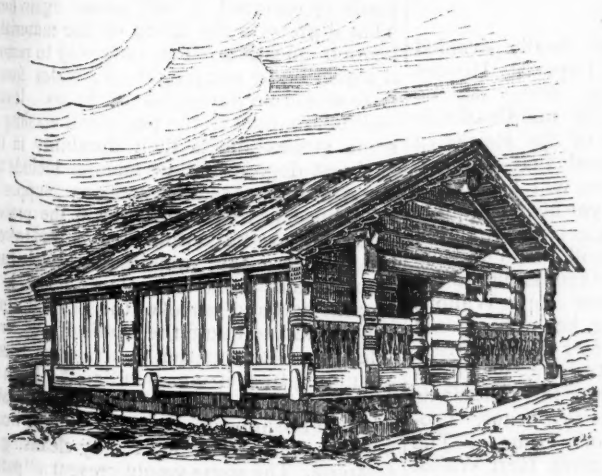


Fig. 8.—A Hut at Nyhus.

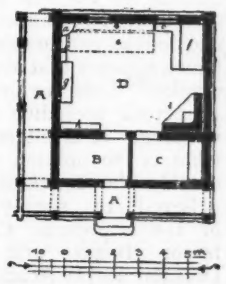


Fig. 9.—Plan to Fig. 8.

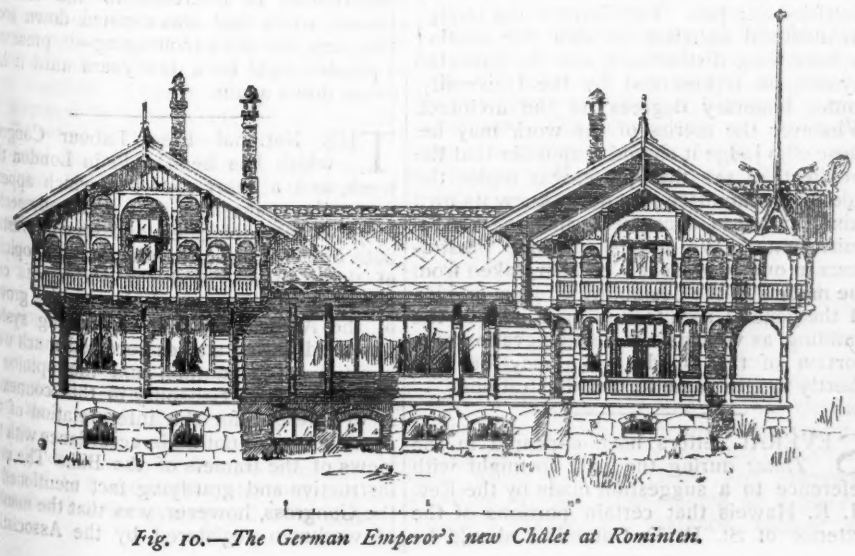


Fig. 10.—The German Emperor's new Châlet at Rominten.

A NOTE IN GERMANY.

A GOOD deal is heard from time to time of the spread of German influence in Africa, and of the development of a German colonial policy. At other times it is the introduction of German manufactures into various markets which have hitherto been largely a monopoly of English manufacturers to which attention is drawn, and sometimes even it is the competition of German with English goods in our own country. These, however, are only some of the ways in which the increasing and abounding energy of the German nation obtains vent for its force: it is visible within Germany itself in all sorts of ways. No one, indeed, can doubt that the creation of a comparatively homogeneous German empire nearly twenty-five years ago has done much to produce not merely a national military feeling, but also a national energy working for various ends. And there cannot, we think, be the smallest doubt that Germany will become a much more serious mercantile

* The illustrations to this article are reproduced, by permission from Messrs. Dietrichson & Munthe's book.

rival of Great Britain in the future, and that if workmen and capitalists in this country fail to work together harmoniously, or are unable to perceive the importance of the trend of affairs, they are likely to come off second best in the markets of the world.

The energy and public spirit which have received so marked a stimulus in Germany is very apparent in the erection of fine public buildings and works of a similar kind. Among these—and we enumerate one or two to exemplify our statement—one of the most noticeable is the great central station of Frankfort, which was completed in 1889, remarkable not less for its admirable arrangements and simplicity than for its enormous size. It is significant of a principle which has recently been worked out in practice in Germany, and which is sure to receive fresh additions—namely, that of concentrating the various lines which touch in a great town in one central station. Unquestionably such a concentration is hardly possible in this country, however desirable it may be. In Germany there is practically a system of State railways, and thus there is but one governing body. It is obviously absurd that in London the three great northern lines should have their separate termini within a mile of each other; but it is an anomaly which we must expect in a country which has not a State railway system, and it is possible that it may be counterbalanced by some advantages. The same principle has been carried out at Cologne, where there is now a central station, not only convenient and roomy in its internal arrangements, but showing externally a desire to make the building worthy of an important town. This desire is one of the noticeable features of the day in Germany, and it must to some extent, we think, be attributed to the sense of national pride which has been aroused by the unification of the empire. Frankfort is, after Berlin, perhaps the most striking example of this. We need not refer to the Opera House, which was completed and opened in 1880, a work well known to our architectural readers. But there are other important public buildings, such as the Bourse; at this very moment a new Post Office is in course of erection and almost completed in the Zeil, which will be an important addition, and a very necessary one, to the great buildings of this city. It is appropriately surmounted by a winged Mercury, whose freedom of movement, however, appears to be hampered by some unnecessary drapery, typical, perhaps, of the red tape which appears to be inseparable from all Government departments. This determination to erect buildings worthy of a great empire is not, however, confined to populous cities like Frankfort—it may be seen in a comparatively small town such as Wiesbaden, where a large new theatre is nearly completed. This is in a Classical style, with pediment and columns, and sculpture. Its position in an open space, with gardens and trees around, gives it an importance which would, to some extent, be lost were it closed around by other buildings.* But one may go yet lower down the scale, and take the post-offices which have been of late years built in small towns and villages. These are always roomy and well-finished inside, and have ample accommodation for the public and for the employees, and with some attempt, more or less successful, at architectural effect externally. And in regard to these German post-offices we may well call attention to the noticeable difference which is at once evident between them and English offices. In Germany facilities are given for correspondence to the public inside the office. New offices are nearly always built with a commodious hall, in which is placed a table furnished with paper and blotting-pads, and chairs. Thus a person can buy his postcard, write on it what he wishes, and dispatch it as conveniently as in or from his office. When we compare this with the complete absence of writing accommodation which there is in most English post-offices, and the beggarly accommodation which is given in others, we may well ask for an energetic Bureau, and not a department like our Post Office—a mere division of the Treasury.

This, however, is a digression. Our intention in alluding to the new German post-offices was to cite them as evidence of the widespread national attempt in Germany to make the towns worthy of the first European empire. Of Berlin we have said nothing, for in the capital it is natural to find many new and important buildings; it is in the cities and towns at a distance from the seat of government that we must look for the true evidence of the general national feeling. Germany has conquered in war, and she is determined to be great in the arts of peace. Public attention is so much drawn to the extraordinary efforts made to keep her army at the highest pitch of efficiency, and to fulfil the object of the highest military authorities that she shall be "a nation in arms," that we are apt to overlook the way in which she is pursuing objects better in the estimation of many than the creation of big battalions and deadly artillery. Yet the very increase in her towns, and the number of important buildings, and, in a word, the growth of material and commercial prosperity are actually causes which tend toward greater armaments in Germany, since the preservation of even the least important building in a country town depends in a sense on the armies by which the empire is defended. Everywhere, indeed, is now visible in Germany the signs of an energetic and growing nation, youthful in the way in which things are swept and garnished, and vigorous in the determination to create and to defend; to be not only the first of military, but also of commercial nations; to have not only the largest and most efficient army in the world, but great material prosperity within its territories.

* Some further information about this theatre will be found on page 307.

NOTES.

IT has now been finally decided that the new Imperial Houses of Parliament at Berlin will be opened about the middle of this month, and the members of the Reichstag have already been informed that the first meeting of the new Session will be on the 25th inst. Nothing has as yet been definitely decided as to the opening ceremony, and it hence appears that there will be no unusual display. This, we understand, is due to the Emperor's prejudice against Herr Wallot's building. It is interesting, however, to see what is the opinion of Herr Wallot's work outside the Imperial *entourage*, which is believed to simply echo the criticisms of the unpopular Court favourites, Professor Begas and Herr Ihne. The Dresden Royal Academy gives Herr Wallot the most coveted German professorship at its schools, which was formerly held by Gottfried Semper. The German and foreign architectural societies vie with one another in bestowing distinctions, and the educated laymen, as represented by the University, confer honorary degrees on the architect. Whatever the merits of the work may be, those who judge it should remember that the architect, in the first place, was under the rule of a committee that never knew its own mind, and was constantly changing its requirements. We published some illustrations in our New Year's number, taken from the models of the design, which gave an idea of the general architectural treatment of the building, as well as the detail elevation of a portion of the façade. We may be able shortly to give some further illustrations.

SEVERAL letters have appeared in the *Times* during the past fortnight with reference to a suggestion made by the Rev. H. R. Haweis that certain portions of the exterior of St. Paul's Cathedral should be washed down "with soda and water or pure water" in order to rid the stone of its coating of soot. From the general tenour of Mr. Haweis's remarks, one might suppose that his proposition is a novel one, whereas the idea has been mooted times out of number. Indeed, unless our memory is at fault, portions of the building were treated in this manner some years since. Be that as it may, it is well known by everyone who takes an interest in London building stones that the practice of periodically cleansing the surface of them with water was commonly in vogue from thirty to forty years since. Had Mr. Haweis been aware of this, and had he taken pains to ascertain the reasons why this "cleansing" process has been more or less abandoned, he might possibly have spared himself the trouble of raising the unnecessary discussion in the columns of our contemporary to which we have adverted. Westminster Abbey, too, with certain statues along the line of route from St. Paul's are recommended to the tender mercies of the Fire Brigade. The fact is that oolitic building stones and all others that are fairly absorbent require something more than mere washing to render them white again after being subjected to the soot and dirt of London. The filth gets engrained in the outermost coats of the stone, and anyone who has paid much attention to the subject knows that the foreign particles are often encased in the hard skin chemically formed on the exterior. The precise nature and origin of this skin have never been properly investigated, though some attempts have been made in that direction. But we know that in regard to the majority of limestones it is formed at the expense of the substance of the stone. On exposure to the atmosphere the initial quarry water is drawn by capillarity to the surface of the block and evaporates. It there leaves behind a sort of deposit composed of mineral matter obtained from the interior of the stone. It has been held by most competent authorities that if the hard skin thus made is removed it will never again form. That it protects the fabric of the material is beyond question. The only way to remove it would be by scraping it off; water from a hose would be powerless to do so. It may well be doubted if the periodical washing of some stones affects their durability in the slightest degree, but we cannot include the stone of St. Paul's in that category. Supposing the edifice were scraped down, the process would have to be continually renewed to keep the surface clean, and in time much harm would result from that alone. Soot is at present part and parcel of the London atmosphere, and, to quote the words of a writer in reference to this matter, you "cannot divorce a building from its surroundings." From an artistic point of view it is very questionable whether the appearance of the building would not be considerably marred by cleansing or scraping. The stone would present a "patchwork" appearance when finished, and our experiences in reference to the Mansion House, when that was cleaned down some time ago, are not encouraging—it presented a pitiable sight for a few years until it had toned down again.

THE National Free Labour Congress which has been held in London this week, and a short report of which appears on another page, was very well represented by provincial delegates, and was interesting both on account of the unanimity of opinion of the Congress and the statements contained in the report relating to the growth of the Association. The picketing system practised during strikes received much well-merited condemnation, and the opinion of the Marquis of Salisbury in this connexion is of interest, for the interpretation of the present law cannot be in accordance with the views of the framers of the Bill. The most instructive and gratifying fact mentioned at the Congress, however, was that the number of workmen registered by the Association

during the last twelve months amounted to 11,540, and that its total membership is now over 51,000. These figures were given in the annual report, and, if they are correct, and we see no reason for doubting them, they indicate the growth of an intelligent opinion on the part of working men, and suggest that the days of tyranny of the new trades unions are numbered. The genuine expressions of opinion (for such they undoubtedly were) of some of the delegates as to the extent of this tyranny were sufficient to convince any impartial hearer of the immorality and narrow-mindedness of those responsible for the tactics of the unions, and we believe that if the disastrous effects of these tactics could be properly represented to the average working man, he would consider that the questionable advantages which are to be gained by combination are of less moment than the cruelty and wrong which they entail.

IN regard to the closing of the Empire Theatre, we may point out the fallacy of requiring a building expressly built to suit certain requirements to be cut about and adopted for entirely different purposes. Mr. Verity's theatre is, from an architect's point of view, in no way suited for the alterations desired by the County Council. The lines on which the auditorium was set out were governed by the owners' requirement to have ample promenade room, and *not* to obtain a maximum number of seats. Here, as in all other countries, the income of this class of theatre is not intended to be governed by the actual seating accommodation, and nothing but the entire reconstruction of the auditorium would make it possible for the expense of an ordinary performance to be covered. Part of the essence of a "Variety" entertainment is a certain freedom of restraint as to seat; promenade-room being a recognised necessity. In Austria the whole floor of the auditorium is practically a promenade; the seating accommodation being in the restaurant fashion, at small tables. The open-air Variety stages at Copenhagen and Stockholm also adopt the same kind of unfettered arrangement, only a few fixed seats being provided. It is impossible for a house built for promenading to be equally suitable for full seating accommodation.

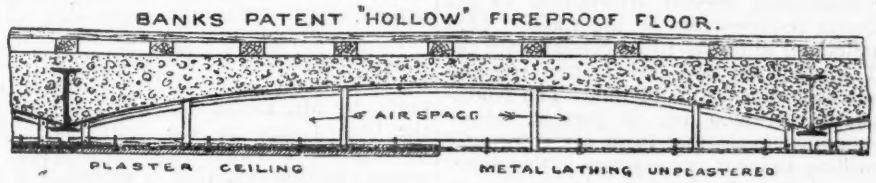
DR. FURTWÄNGLER contributes to the current number of the *Berliner Philologische Wochenschrift* a paper on the significance—for the history of ancient art—of the discoveries at Delphi. His remarks on the Sphinx of Naxos will interest architects. The Sphinx is supported, it will be remembered, on a base consisting of a huge column, surmounted by an Ionic capital. This capital is of the first importance in the history of the development of the Ionic order. The volute and the cyma are still distinct and independent, not passing over the one into the other, and this supports the theory long ago put forward by Puchstein ("Das Ionische Capitell," 1887), as to the development of the Ionic capital. All the important portions of both Sphinx and base have been discovered, so that it can easily be put together. This is being done, and it is proposed to take a cast of it, which is to be set up in the Louvre. The Sphinx itself is of unmistakably Samian style, and, as is usual in sculptures of that school, is of marble from Naxos. Dr. Furtwängler opposes the theory started by Dr. Sauer, that this Samian style took its rise in Naxos; both the architecture and sculpture point to Samos. Of even greater architectural importance is the "Treasury of the Athenians," for two reasons—it is admirably well-preserved, and, as we have before noted, securely dated. With the exception of the lowest step, which, as in the case of the Athenian stoa, is of rough calcareous stone, the whole structure is of Parian marble, the metopes of the finest marble, the triglyphs of a somewhat inferior quality and of a bluish colour. The architectural details are carried out with a fineness and finish that is, according to Dr. Furtwängler, so far unique. The precision with which both its inscription and literary tradition date it will upset more than one recent hypothesis, especially that which would date back the Æginetan sculptures to the sixth century B.C. The Athenian Treasury shows clearly that they must belong to the time of the Persian wars; presumably the temple of Ægina was built after the first attack on Athens, *i.e. circa* 489-487 B.C. Further, the metope sculptures at Delphi have an important bearing on the archaic "Acropolis" statues. Those of the "Chios" type have their clearest analogy in the Delphian metope heads, and must, therefore, presumably have been executed, not as was formerly supposed, in the time of the Peisistratidæ, but in the period between their banishment and 480 B.C. By a similar course of reasoning we can no longer, with Dr. Kalkmann, place the Olympian sculptures as early as the beginning of the fifth century B.C.

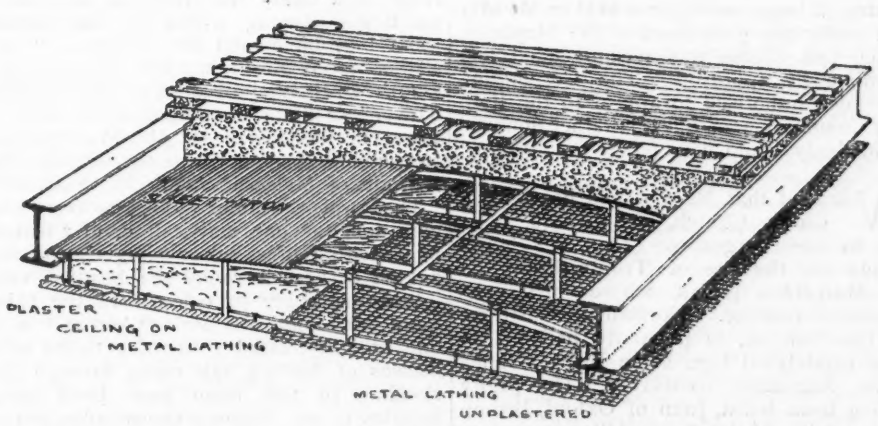
THE Art Gallery Committee of Manchester has arranged to hold an Arts and Crafts Exhibition, in the rooms of the City Art Gallery, in April next. The main objects are to bring together a number of fine examples of industrial art, with a view to educate the public taste, and to identify the actual designers and skilled workers, in respect of the exhibits that may be sent in, with the works exhibited. The Committee invite the co-operation of employers, trade guilds and societies, and of others interested in the promotion of artistic industries, with the object of ensuring an exhibition of high merit. Those wishing to exhibit can apply for a prospectus to the Curator of the City Art Gallery, Manchester.

THE New Court Theatre at Wiesbaden, which has lately been opened by the German Emperor, is one of the most successful of Messrs. Fellner & Helmer's many playhouses. The commission was the outcome of a limited competition against Herr M. Semper, of Hamburg, and Herr Frentzen, of Aix-la-Chapelle. The new building will seat 1,400 persons. There are three tiers, of which the first, or lower one, is divided up into boxes. The stage measures about 80 ft. by 65 ft., and is intended for operas and spectacular pieces as well as plays. Great attention has been paid to the stage machinery, which is worked by hydraulic power. Herr Brandt, the Chief Engineer at the Berlin Opera House, is responsible for this department. He has also introduced a movable orchestra floor, which can be raised and lowered according to the requirements of a piece. Wagner's operas, for instance, require a hidden orchestra, whilst the small string band for a Strauss operetta should be in view. The cost of the building is close on 100,000*l*. The estimates in 1892, when Messrs. Fellner & Helmer's design was accepted, figured at 79,500*l*. The only complaint we have so far heard of is the "sighting" from the stalls, where the rows of seats do not rise sufficiently behind one another.

AN interesting Exhibition of Fireproof Construction and Fire Tests was given by Banks' Fireproof Construction Syndicate at the St. Pancras Ironworks, Belle Isle, N.W., on the 26th ult. In the case of the new fireproof floor brought out by the syndicate, a severe test was applied as to its fire-resisting qualities. The invention consists of a suspended ceiling of steel lathing which acts as the fire-checking material, being coated with plaster. Between this ceiling and the floor above is an air chamber through which, by the use of air bricks in the exterior walls, a current of air is allowed to pass. The great advantage claimed for the invention is that the constructive iron or woodwork is not in contact with any substance reached by the flames, a moving body of air acting as a non-conductor. Above the suspended ceiling are concrete arches 4 in. in thickness at the crown, resting upon sheet-iron, which in its turn is supported by T irons bent to the curve (see illustration). The total thickness of the floor is 10 in. to 12 in. In the cheaper forms, the T irons and the sheeting are dispensed with, the concrete being laid on temporary centres. In regard to the actual test applied, a small four-roomed erection had been constructed, the floors of the upper story and the partition walls being built on the system above described; the ground floor was filled with shavings and pitch-pine, on which was thrown petroleum, the whole being then ignited. The fire burnt for three-quarters of an hour, after which it was extinguished. Unfortunately, the pyrometer burst at 1,500 deg. Fahr., so the ultimate temperature was not gauged. When the interior was sufficiently cool to allow of examination, it did not appear to be damaged, the ceiling, with the exception of a few slight cracks, being intact, and the shavings placed on the floor above had not been ignited. The syndicate claim for this floor that it is fireproof, noise-proof, light, and cheap. As no figures have been issued as to the cost, it is impossible to compare it in this respect with other well-known constructions.

BANKS PATENT "HOLLOW" FIREPROOF FLOOR.





THE municipal control of the tramways in Glasgow has hitherto resulted in a loss. It is true that they have not long been under the control of the Corporation, but

even their present want of financial success should make Corporations very careful before they make such undertakings as these public property. No doubt a smaller profit is sufficient when tramways are under public control, since it is sufficient to pay the interest upon any capital which may have been raised in order to purchase the undertaking. But the public expect more from an undertaking which is, so to speak, their own property than when it belongs to a private company, and there will certainly be a tendency to give comfortable travelling at the expense of the general body of ratepayers. There is likewise a vital difference between taking under municipal control the lighting and supply of water, necessities for all classes, and the means of locomotion, which are not required by all, and only serve certain parts of a city.

IT is not at all surprising that the people of Sunderland should consider themselves badly treated by the North-Eastern Railway Company. The central station at that town is, for a place of the size and importance of Sunderland, one of the most inconvenient in the country; and the railway company appear to have persistently turned a deaf ear to the representations made to them from time to time as to the great need for improved accommodation. Many stations at large towns have been enlarged and improved of late years, but the stimulus of competition appears to be sometimes needed in addition to the growing requirements of the traffic. That Sunderland still has to be content with the old inadequate low-level station may be taken as an illustration of this. The North-Eastern Co., who are, at present, secure from opposition in that town, are apparently unwilling to incur any expense in this direction, and the inhabitants are driven to seek the intervention of the Board of Trade in the matter. A large meeting was held on Monday last under the presidency of the Mayor, at which this course was recommended and unanimously approved. The Corporation were also authorised to appeal to the Railway Commissioners, but it is rather doubtful if this body would have power to interfere.

WE read that Mr. Cobbold has bought Christ Church, at Ipswich, as a gift to the burgesses. This old house stands on the site of Trinity Priory, in St. Margaret's parish, whose history is somewhat obscure. Norman de Gastrode, or Fitz-Eadnoth, is popularly believed to have established here some Black Canons of St. Augustine, *circa* 1177. The priory having been burnt, John of Oxford, Bishop of Norwich, rebuilt it in the following reign. King John endowed Christ Church with the lands and profits of St. Michael and St. Saviour, in Ipswich. The priory, valued at 88*l.* 6*s.* 9*d.* per annum, was suppressed in view of founding Wolsey's Colleges at Ipswich and Oxford, but its revenues were not so appropriated, and after the Cardinal's disgrace were bestowed, in 1544, upon Sir Thomas Pope, Knight, who pulled down the buildings and erected the existing house in their stead.* Pope, it will be remembered, did the same thing with Bermondsey Abbey, building for himself a house there with the materials of the abbey. He also refounded Durham College, Oxford, as Trinity College, in 1554. Christ Church passed subsequently to Leicester, Viscount Hereford, and from his successor to Claude Fonnereau, in whose family it continued for a long while. At a meeting in Ipswich ten years ago of the Suffolk Institute of Archæology, a member stated he had seen a stone, inserted in the wall of the entrance into the Chapter House of Oxford Cathedral, being the foundation-stone of the college Wolsey set up at Ipswich in place of the Black Friars monastery of SS. Peter and Paul, founded by Thomas Lacey and Alice, his wife, *temp.* Henry II.

* By another account Sir Edmund Withipool built it, in 1550.

THE Exhibition ot the Institute of Painters in Oil contains the usual proportion of interesting to uninteresting works; perhaps some of the former show more force and interest than usual. It is to be regretted that it is impossible to say this of the President's contributions; his "Autumn" (241) is a half-length with even less than the usual amount of expression in the face, and not the usual amount of colour effect and picturesqueness in the costume; and as to Sir J. Linton's landscape "An Autumn Day" (333) one positively cannot tell what he is driving at. Among the strong points in the first room are Mr. Brangwyn's powerful and boldly-handled scene "A Trade on the Beach" (17) somewhere in North Africa, with the negro heads standing out against the sandy background (the texture of which, by the way, is very loosely indicated), in a manner rather reminding one of some of Professor Müller's works which used to be familiar objects at Mr. Wallis's Gallery. Mr. Kennington's "Pierrette" (39) is a clever study of a head in strong light, but not a thing quite worth Mr. Kennington's efforts. Mr. Hope M'Lachlan, in "Ships that Pass in the Night" (54), has attempted to make a picture out of an indication of a rough sea in a dark night; the difficulty is to convey the appearance of water where there is hardly any reflected light; it is almost attempting an impossibility, and the picture is interesting as an experiment rather than in any other sense. A noble landscape by Mr. Wimperis, "Carting Gravel" (95), and "A Dorsetshire River" (105), by Mr. Leslie Thomson, are among the best things in the exhibition. Mr. Cotman's "A Threatening Sky" (115), is rather a bold sketch than a picture, but his "Steaming into Lincoln" (517), in the third room, is a really fine work in landscape-painting. Among works in the second room may be named Mr. Dollman's "Her Father" (200), Mr. Frampton's "Sunset, Rye" (229), Mr. Stanhope Forbes's "Paul Church Tower" (258), a rural road scene with a tower in the distance; Mr. Fraser's picturesque boat, going before the wind in the "Straits of Malacca" (299), Mr. Shannon's "The Purple Stocking" (308), a curious "side elevation," as one may call it, of a female figure with a brass salver hung up forming a kind of aureole round the head—a very interesting study in colour. In the third room Mr. Fantin-Latour's "Aurore" is a fine broadly-treated study of a figure with masses of floating hair rising through the clouds. In this room have been hung together in one corner a choice collection of curiosities of impressionist and Whistlerian tendencies, some of them hideous in colour; the only thing among them worth anything is Mr. Grier's little study called "Early Morning," with the lights of fishing-boats faintly reflected in calm sea. Mr. Fowler's "Under the Hollow-hung Ocean Green" (447) is an interesting nude figure-study treated in an imaginative manner.

THE point of attraction in Messrs. Tooth & Sons' Winter Exhibition is one of the most beautiful little works by Mr. Tadema that we have ever seen, "Past and Present Generations" (26), two figures on a terrace which is adorned with a row of carved terminal heads in marble. In the truth of the lights and shadows on the marble the artist has almost surpassed himself, and the contrast between the sculptured heads and the two living ones gives an additional piquant charm to the scene. The collection includes Sir F. Leighton's "Summer Slumber," which was in the last Academy exhibition, and several others that were seen there, as well as various other paintings of a high average of merit. M. Binet's landscape, "Near Rouen" (88), is a very beautiful and delicate work, rather unusual in style, and gains additional effect by contrast with two landscapes of the old "melodramatic" type, by deceased painters, H. Bright and Danby, hung close to it. These memorials of a past school of art are curious indications of the length of road travelled since they were painted.

THE exhibition at Mr. Maclean's Gallery includes a life-size lion by Mr. J. M. Swan, a grand piece of drawing but somewhat feeble in the head, looking like a tamed and civilised lion. A comparatively small picture by Mr. C. E. Johnson, showing Salisbury Cathedral as the central point in a calm and sunlit landscape, reminds us pleasantly of his larger work on the same subject (but from a different point of view) which was one of the best landscapes in this year's Academy. The exhibition includes works by Messrs. Binet, Wimperis, Seiler, &c.; among others a forcibly painted architectural scene, "Venice," by M. José Villegas.

THE collection of "representative" works by Anton Mauve at the Goupil Gallery is, in the sense of that adjective, a good one, for it illustrates the most characteristic qualities of his art. He is an artist who has been rather over-rated in consequence of the effect produced by one or two exceptionally original and successful paintings which became widely known. But he repeats the same note very often, and not always so powerfully as in the exceptional pictures referred to. His broad style of handling is always the same in its merits, and is quite removed from the commonplaces of art; but in seeing a number of his pictures together one is equally struck with the "dirty" colour of many of them, and the almost entire absence of sunshine. They seem to weigh on the spirits, and depress one like a dull day in actual weather. "The Flock Grazing" (28) is the only one in the collection which seems to show a glimpse of sunlight; everything else is a weary grey. The composition is always good and suggestive, but one comes away from the exhibition with the feeling that one Mauve is enough at a time.

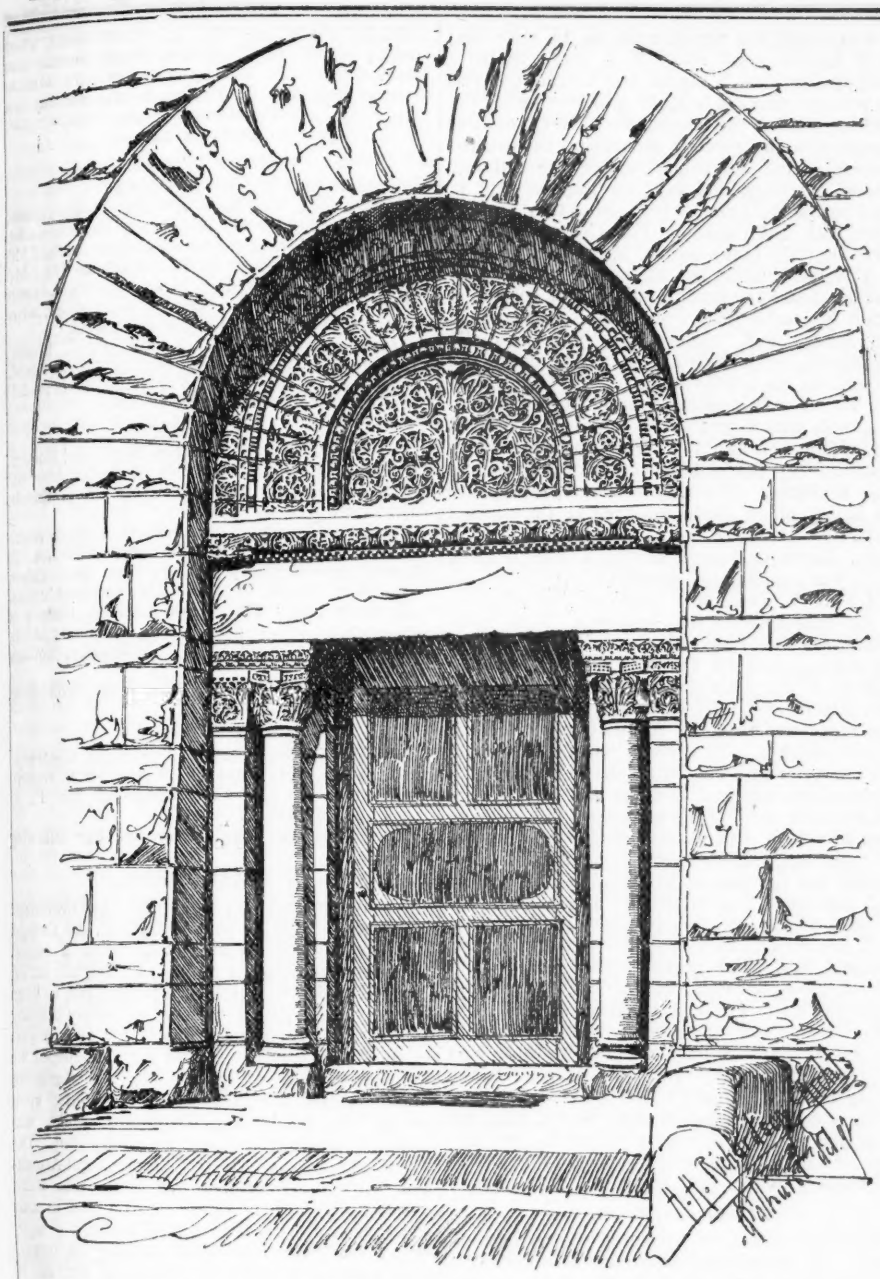
UNDER the title, "The Changes in London Building Law," Messrs. E. & F. N. Spon will have ready almost immediately a small book consisting of a critical analysis of the new London Building Act, by Mr. H. H. Statham. It will give the substance of the articles which have appeared in the *Builder*, with considerable revision and some new matter, and will contain some diagrams illustrating the operation of the "horizontal line" and "diagonal line" in determining the height of buildings under the Act, and also a list of the thicknesses of walls required under the Act, reduced to the form of a schedule similar to that in the 1855 Building Act, so as to be read at a glance, in place of the cumbrous writing out of these provisions in the new Act.

DOORWAY OF HOUSE, CHICAGO.

THIS is one of the late H. H. Richardson's characteristically treated doorways, in a private house facing the lake at Chicago. The house is quite a plain structure otherwise, the exterior decorative treatment being concentrated on the doorway. The illustration is from a sketch by Mr. Oscar Tolhurst, an American draughtsman and etcher now resident in London.

LETTER FROM PARIS.

THE question, so long studied and continually adjourned of the Metropolitan Railway, seems to have entered into a new phase which will perhaps be decisive. The present Minister of Public Works, M. Barthon, whose recent visit to England has enabled him to appreciate the inferiority of Paris in regard to means of transport, has resolved to defend the new scheme with all his energy, and wishes particularly that everything shall be completed by 1900. That would be easy enough, for the plans are entirely drawn out, and theoretically one might commence to-morrow. But the approval of the Chambers and the Municipal Council is necessary. We have already explained the reasons for the hostility of



Doorway of Dwelling-house, Chicago. Sketched by Mr. Oscar Tolhurst.

this latter assembly to an innovation which would upset the economical and financial conditions of the City of Paris, by diminishing the receipts of the octroi and the value of house property. Thence will arise the special difficulties the Government will encounter, in the discussion of the Metropolitan Railway question, which the Municipal Council is at present examining, from the threefold point of view of finance, street maintenance, and work beneath the street-level, in regard to which the great network of sewers will have to be modified at many points. We have also described, in its main features, the new route proposed. We need only add here that the Metropolitan Railway will include two main lines of route, A and B, intended to unite the two principal branches of the Ceinture Railway, and two other lines not yet determined, and not even submitted to enquiry. We can only hope that by 1900 the A and B lines, crossing each other from north to south and from east to west, and their connexions with the Ceinture, will be completed. That will be one step gained. The line A, branching out of the Nord Railway line at the Pont Marcadet, will run under the tenth, third and first, and fourth arrondissements, will cross the Seine on a viaduct, above the Pont Sully, and after having traversed the quarters on the left bank, will join the new prolongation of the Sceaux Railway to the Luxembourg. It will have thirteen stations on its route. The line B, branching out of the Vincennes line, and also crossing the Seine on a viaduct near the Gare d'Orléans, will arrive, after nine stations only, at the proposed station "Des Invalides," the future terminus of the Moulineaux line, which will eventually become the centre for the trains from Brittany and for the State Railway, which have at present such cramped accommodation at the Mont-Parnasse station. These two main lines will have four points of connexion at the Lyons, Orléans, Sceaux, and Champs de Mars stations, and by this system the movements of travellers in Paris will be provided for by eight complete circuits on which the various trains will be able to succeed each other, during the time of the exhibition, at intervals of three minutes. As to the two other possible lines not yet determined on, the one, according to the scheme of the Department of Public Works, is to unite the Gare de l'Est with the Gare de la Bastille, by an elevated road, with a connexion with line B; the second, which will be entirely underground, will branch from line A, with a double connexion both with the Halles and the Hôtel de Ville, and will join the existing Auteuil line at the Gare St. Lazare.

Such is the system offered by M. Barthon for the approval of the Municipal Council, the realisation of which implies the consent (exceedingly doubtful) of our ædiles; unless the Government decides to step in and carry out the scheme, in the interests of the general public, without regard to minor interests. The State has undoubtedly the power to do so.

The preparations for the future Universal Exhibition, from which we are now only separated by five years, begin seriously to occupy public opinion. In regard to the competition, the continually-increasing number of competitors will require, for the public exhibition of the designs, a considerable space, and they will probably be placed in the Palais de l'Industrie, when the "Exposition du Livre" has terminated. This general preoccupation about the exhibition shows itself also among the State manufactories, which desire to celebrate the opening of the new century by an exhibition of exceptional importance. Thus the Sèvres manufactory wishes to organise its own exhibition in an entirely new fashion. Recent researches have enabled it to recover a method in porcelain manufacture which permits of most varied application of colour, and on the basis of this new procedure the management proposes, instead of installing its exhibition in the interior of the main building, as in 1889, to erect a special building offering to architects the most novel resources in colour decoration, and which will form in itself a specimen on a large scale of the work produced in the Sèvres ateliers.

The designs for the competition which the Municipality has opened, for the Ledru-Rollin group of schools, are at present on view at the Hôtel de Ville; thirty-one architects have taken part in the competition. The first prize has been awarded to MM. Bourgeaud and Lecardonnel, the second to MM. Bévière and Lefevre, and the third prize to MM. David de Penanrun and Gregoire. There are few designs that are either remarkable or signed by well-known names; we may mention, nevertheless, those of MM. Hennequin, Morin-Goustiaux, Bonnier and Pierron, Gaston Trelat and Lepouzé, which merit special notice.

Among the special competitions organised by the municipal administration is that for the purification of the Seine water; 142 competitors have put in their claims, and the committee of examination has just commenced its labours. Another Municipal competition will shortly be opened for the best means for the prevention of smoke from steam-engine furnaces. It is to the credit of the Municipality of Paris that questions of hygiene are the objects of its special attention: thus it has only recently prepared a new regulation in regard to the sanitation of Paris, which provides that in every house built in Paris there must be one water-closet for each set of apartments, or for every three rooms let separately, with a sufficient and permanent water-seal, and a supply-cistern amply sufficient both for cleansing the basin and for carriage to the public sewer. The same regulation stipulates, besides, that there should be separate trapped drains for slop-drainage and for rain-water. The requirements relating to the number of water-closets and their efficient drainage apply to all houses to be built thenceforth, and may be demanded in the case of houses already built, if considered necessary for their sanitary condition. There are other regulations in regard to house drainage and connexion with the sewers which will only come into force in process of trial and in accordance with special orders of the Council during the course of the next three years, after which time all cesspools and other systems at present in use must be disinfected and destroyed, and everything be drained direct to the sewer.

These regulations, of which we have given a general summary, have been drawn up by the Sanitary Engineers' Department, whose intentions are excellent, but who have made a mistake in not having first consulted architects. The result is that there are serious omissions, and in consequence serious difficulties in the application of the regulations. The diameter and construction of the drain-pipes, and their connexion with the sewer, have been carefully specified, but nothing is said about the construction of the "Cabinets d'Aisances," the section of the basins, and other important points. The absence of any precise directions of this kind will allow the proprietor to put up anything he pleases in any fashion he likes, so long as he satisfies the regulations as to connexion with the sewer. Nor is any account taken of the deficiency of water supply to which Paris is often subject in the height of summer. In that case, unless the amount of public water supply is considerably augmented, it will in some quarters be quite impossible at times to ensure proper carriage to the sewer. Other criticisms might be made, all tending in the same direction, and leading us to regret that the "Service de l'Assainissement" did not consult some experienced architects in drawing up regulations which are of such great importance.

On the other hand, we may congratulate the Administration on the new department which has been in operation for the last year at the Hôtel de Ville, under the title of "Casier Sanitaire." This service is for the houses of Paris what the service of the "Casier Judiciaire" is for individuals. Every house has its own file of papers complete—classed, labelled, and indexed according to district and street. Each set of papers includes a minute description of the house, with sketches to the scale of $\frac{1}{50}$, as well as its dimensions, the number of blocks of building and of courts, the method of drainage, the service of water laid on, and the number of separate tenements. A special paper gives the statistics of the principal contagious diseases (consumption, typhus, diphtheria, small-pox, cholera, &c.). Another paper states the disinfections carried out by the Administration in the case of contagious diseases, and the

record is completed by the sanitary inquest, by the result of scientific enquiries and analysis carried out, and by the record of the works which have been carried out by order of the "Commission des Logements Insalubres." It is calculated that it will take five years to bring the "Casier Sanitaire" entirely up to date; it will then include about 92,000 separate records of houses. It already includes 9,000 houses minutely described, and 40,000 records in regard to contagious diseases and disinfections carried out. It may be added that the Senate has recently had under its consideration a law, already passed by the Chamber of Deputies, headed "Protection de la Santé Publique."

Leaving the subject of hygiene, important if not very interesting, for those of art, we find at the Ecole des Beaux-Arts the exhibition of the designs for the Janvin d'Attainville competition, which has just been decided. As we have already mentioned in previous years, the competition is in two sections—historical painting and landscape. In the first section the subject was a tympanum over a door, with a central circular panel illustrating the glorification of poetry. We are sorry to say that the works exhibited were exceedingly poor, both in idea and execution. Nevertheless the prize and first medal have been awarded to M. Robert Dupon, pupil of MM. Delaunay and G. Moreau. The landscape competitors had to represent a river with wooded banks, in early morning light, near a town, the houses of which were to show in the distance. Here the competitors have been more successful, especially M. Amédée Buffet, pupil of MM. J. Lefebvre and C. Robert-Fleury, who obtained the first prize.

The Académie des Beaux-Arts has just selected the artists who will take part, in 1895, in the Chenavard competition, who must send in their works from the first to the 15th April next. The following are the architects selected, and the works that they propose to execute:—M. Chifflot, "Bridge at the Mouth of a River"; M. Bigot, "A Temple to Glory"; M. Lecardonnel, "A Building for Horse Shows"; M. Bernard, "Private Chapel for a Château"; M. Héraud, "A Carthusian Convent." In connexion with the Académie des Beaux-Arts, we should also mention the architectural pupils, MM. Jaussey and Bernard, who, as the most successful during the year, have obtained the Jean Leclaire prize. We may add also that M. Pillet has been appointed as Professor of Civil Construction at the Conservatoire des Arts et Métiers, in place of M. Trélat, who had completed his term of office.

We cannot conclude this letter without a few words in reference to the Exhibition "de la Fleur," which has just been opened at the Georges Petit Gallery. It would have been a happy idea to illustrate "The Flower" in its double use as symbolism and decoration, as it has been used and interpreted by different nations: symbolical in ancient Egypt and India, naïve and merely ornamental in Romanesque and Mediæval architecture and Mediæval books. It might then have been traced through the Renaissance period and down to the present day, when it has become an important element in female costume. But this the organisers of the exhibition referred to have failed to perceive. They have merely got together a medley of furniture textiles, lace, and pictures, in which flowers have been introduced (some of the latter signed by Delacroix, Courbet, Corot, and Paul Huet), along with porcelain, metal-work, &c., all bundled together without any method. It would have been easy to do better than this, and the exhibition is a disappointment.

THE ARCHITECTURAL ASSOCIATION:

ANNUAL MEETING.

THE annual general meeting of the members of the Architectural Association was held on the 26th ult., in the meeting-room of the Royal Institute of British Architects, Mr. E. W. Mountford (President) in the chair.

Annual Report, &c.

Mr. E. S. Gale proposed the adoption of the report for Session 1893-94. The report will be found on pages 147 to 166 of the new "Brown Book," and from it we learn that the Committee held thirty meetings during the Session, that ninety-six new members were elected, four were re-instated, and that the losses by death, resignation, and other causes amounted to ninety-eight, leaving a net increase of 2, the total number of members being 1,131. An innovation, which has had good results so far, has been the holding of a meeting of class secretaries for the discussion of Architectural Association matters from their point of view, and the report goes on to state that much benefit must result from these students' meetings, by which means the Committee and the younger men are brought into touch with the teaching work of the Association. The Committee records with the greatest satisfaction the marked increase in the numbers attending the ordinary general meetings, and also the improvement in the financial position of the Association as compared with last Session. The Committee have viewed several premises, but hitherto none have been found suitable, but the matter is still under consideration; the need for additional accommodation is greater than ever. The attendance in the Studio and classes has been generally satisfactory, particularly as regards the number of students in the Studio and classes in Divisions I. and II. The Committee regret to report unfavourably with regard to the number of students in Divisions III. and IV. This poor attendance indicates, they think, the necessity of re-arranging these divisions. The Committee also refers to the falling off in the attendance at the summer visits.

Mr. Leonard Stokes seconded the motion, which was unanimously agreed to.

Mr. H. W. Pratt next proposed the adoption of the balance-sheet and accounts. The main feature was that they had not only been able to pay the expenses for the past Session, but had made up to the general fund the amounts taken from it to meet the deficits of the past two years. The result was that the Association started the present Session with a clean sheet. He would also like to move a vote of thanks to the auditors, Messrs. Lonsdale and Sim, for the trouble they had taken in auditing the accounts. The balance-sheet shows an expenditure for general purposes of 1,904*l.* 14s. 6d., in which is included the sum of 148*l.* 12s. 9d. carried to premises and general fund account. The income of 1,904*l.* 14s. 6d. includes 763*l.* 17s. for members subscriptions, 199*l.* 10s. for entrance fees, and 912*l.* 7s. 6d. for students' fees. The premises and general fund account shows donations of 150*l.* 4s. 6d., while a balance of 832*l.* 15s. 11d. is carried forward.

The motion was duly seconded and agreed to.

Votes of thanks were also passed to those who had taken part in the late Conversazione, to the manager of the Queen's Hall, to Mr. Phené Spiers and other exhibitors, and to Mr. Sim, the Hon. Sec. of the Entertainment Sub-Committee.

Several donations to the library were announced, and votes of thanks were accorded to the givers.

Medals and Prizes.

The Chairman then presented the medals and prizes. He stated that they included the medals for some years past, caused by the delay on the part of Mr. Gilbert, who had kindly offered to supply a new design. The design not having arrived it had not seemed fair to keep the various winners waiting any longer.

Session 1893-94.

A. A. Medal (and Books): Mr. G. Lucas.
Measured Drawings Prize: Mr. J. Allen.
Hon. Mention Measured Drawings Prize: Mr. A. J. Stratton.
Essay Prize: Mr. C. de Gruchy.
Cates Scholarship: Mr. J. Hunt.
Travelling Studentship (Bronze Medal): Mr. C. C. Brewer.
Oliver Prize: Mr. T. F. Green.
Lecture Side: Division I.: Mr. S. L. Crosbie, silver medal; Mr. P. J. Groom, bronze medal; Mr. H. A. Douglass, hon. mention. *Division II.:* Mr. S. Perkins, silver medal; Mr. T. E. Abbott, bronze medal; Mr. H. T. Bromley, hon. mention. *Division III.:* Mr. C. de Gruchy, silver medal; Mr. J. R. Stark, bronze medal; Mr. A. Wood, hon. mention. *Division IV.:* Mr. J. P. Clark, silver medal; Mr. A. J. Stratton, bronze medal; Mr. H. I. Potter, hon. mention.
Studio Side: Division I.: Mr. P. J. Groom, certificate and books; Mr. H. W. Tomes, certificate and book; Mr. F. L. H. Fleming and Mr. S. L. Crosbie, hon. mention. *Division II.:* Mr. T. F. Green, silver medal and certificate; Mr. H. C. Trimnell, bronze medal and certificate; Mr. A. George and Mr. E. W. Lees, hon. mention. *Division III.:* Mr. A. C. Dickie, silver medal and certificate; Mr. A. Wood, bronze medal and certificate; Mr. T. P. Dobson, hon. mention. *Division IV.:* Mr. J. P. Clark, silver medal and certificate; Mr. M. G. Pechell, bronze medal and certificate; Mr. A. E. Henderson and Mr. M. F. W. Bunney, hon. mention.

List of Medallists, Session 1891-2.

Travelling Studentship: Mr. T. A. Sladdin.
A. A. Medal: Mr. A. H. Clark.
Lectures, 1st Year: Mr. F. S. Hammond, silver medal; Mr. G. E. Boys, bronze medal. *2nd Year:* Mr. C. C. Brewer, silver medal; Mr. J. R. Stark, bronze medal. *3rd Year:* Mr. P. R. Smith, silver medal; Mr. A. J. Johnson, bronze medal.
Studio, 1st Year: Mr. R. F. Summers, silver medal; Mr. E. O. Cummins, bronze medal. *2nd Year:* Mr. J. P. Clark, silver medal; Mr. A. Stratton and Mr. F. Taylor, bronze medal. *3rd Year:* Mr. C. C. Winmill, silver medal; Mr. W. C. Waymouth, bronze medal.

Session 1892-93.

A. A. Medal: Mr. W. B. Dawson.
Lecture Side, Division I.: Mr. T. E. Abbott, silver medal; Mr. G. B. Hoole, bronze medal. *Division II.:* Mr. C. de Gruchy, silver medal; Mr. E. P. Wheeler, bronze medal. *Division III.:* Mr. A. Stedman, silver medal; Mr. A. G. Bewes, bronze medal. *Division IV.:* Mr. W. K. Shirley, silver medal; Mr. M. G. Pechell, bronze medal.
Studio Side, Division III.: Mr. C. C. Brewer, silver medal; Mr. M. F. W. Bunney, bronze medal. *Division IV.:* Mr. W. C. Waymouth, silver medal; Mr. A. E. Henderson, bronze medal.

Certificates.

Division I.: Mr. T. F. Green, Greek and Roman; Mr. J. T. Bennett, Materials and Construction; Mr. S. L. Crosbie, Perspective; Mr. P. J. Groom, Elementary Physics.
Division II.: Mr. T. E. Abbott, English Architecture; Mr. S. Perkins, Materials; Mr. A. E. Henderson, Elementary Ornament and Colour Decoration; Mr. C. W. Surrey, Stresses and Strains.
Division III.: Mr. C. de Gruchy, History of Architecture; Mr. C. de Gruchy, Materials; Mr. C. de Gruchy, Geology; Mr. C. de Gruchy, Sanitary Science.
Division IV.: Mr. A. W. Field, Professional Practice.

Extra Subject.

Mr. R. T. Grove, Plain and Solid Geometry; Mr. C. W. Surrey, Land Surveying; Mr. S. Perkins, Chemistry; Mr. A. E. Henderson, Mr. P. F. Hockings, Modelling.

The Chairman next delivered the following address:—

President's Address.

Twelve months ago, when first I had the honour of addressing you as your President, the thought that it would fall to my lot to do so a second time never entered my mind. Fortnightly during the whole of last Session it was your fate to listen to my views upon a variety of widely differing subjects, and it speaks volumes for your powers of endurance that you should have re-elected me for a second year of office. My best thanks are due to you for the great honour conferred upon me by my re-election, an honour which was perfectly unsought and not less unexpected. The duties of a President of the Architectural Association occupy no little of his time, time which occasionally is very difficult to find, and in some other respects his lot is not entirely a happy one. But there are compensating advantages. One makes many friends, and is the recipient of much kindness during one's term of office, and it is pleasant to be sure of receiving warm support from not only the officers and committee but from the Association as a body, whenever such support is required. I am very grateful that it is so, and desire to thank you all, and especially the hon. secretaries and committee, most sincerely for the support so given, without which no President could carry on his duties with any degree of satisfaction. When I say you have always supported me, I mean "well, nearly always," for there remains in my memory one occasion during last Session when you turned upon your President and committee (or at least the majority of the committee) and defeated us upon a division by two votes to one. That you were wrong in refusing to admit women to our classes I am perfectly sure, neither do I doubt that you, or most of you, will sooner or later regret that decision.

While women are allowed and encouraged to work side by side with men in all other branches of art, and enjoy the same privileges of art education, it is a bad thing for us that we should have denied them the same facilities for the study of architecture as we have ourselves. It was edifying, however, to note the high moral tone which the opposition assumed, although it was possibly a little odd that the men (or some of them) who sternly deprecated the presence in their classes of young women, unless duly attended by fully qualified chaperones, are the same men, who up the river or at dances, or wherever opportunity occurs, will dare much to carry off the same, or similar, young ladies to the most secluded nooks they can find, as far as possible from the eye and ear of the then hated chaperone. At least I am told they do.

But, apart from this one mistake, I am exceedingly glad to say that the past Session has been a most successful one, perhaps the *most* successful we have had under the present order of things. The Studio and classes generally have been very well attended, excepting in Division IV., and the work done has been distinctly good. In a large

majority of the classes the first man has gained more than the 80 per cent. of the maximum number of marks necessary to qualify him for a book prize in addition to his certificate, while in several cases he has obtained the full number allotted to the subject. This is very gratifying, as is also the fact that of the 96 new members who joined our ranks during last Session, no less than 73 joined either the classes or Studio, and that there were 78 students who took up complete courses of lectures and classes, 40 of them being in Division I., 25 in Division II., and 10 in Division III. As regards those who are really making use of our educational course as we wish it to be used, and who alone can obtain the full benefit of it, you will be interested to know that of the students who worked in Division I. in Session 1892-3, 14 moved into Division II. in Session 1893-4, while 7 moved from Division II. into Division III., and 2 from Division III. into Division IV. It was my hope that more students would have seen the advantage of this gradual and sustained progress from one division to another; but this is an improvement upon last year, and we trust the improvement may increase, for only so can the best results be obtained.

The continued want of appreciation of Division IV. has been very fully considered and discussed by the Committee, with the result that it has been temporarily abandoned, the subjects hitherto contained therein being either treated as extra subjects, or room found for them in other divisions. It is proposed to re-establish it at the first opportunity.

There is improvement, also, in the competition for our prizes. Six designs were submitted for the Architectural Association Medal, while Mr. Brewer carried off the Travelling Studentship with a set of drawings of unusual merit; and although only one entered for the Essay Prize (Mr. de Gruchy), the sub-committee reports that his production is most meritorious, and well deserves the prize. The Architectural Union Company's prize was not awarded, neither was that offered by Mr. James Brooks. With reference to this last, I am under the impression that the subject, one bay of the vaulting of the cathedral at Oxford, was somewhat too difficult, necessitating, as it did, the use of scaffolding and ladders, as well as residence in Oxford. Mr. Brooks, has, however, kindly allowed me to set the subject for the coming year, and intending competitors, of whom I hope there will be many, will find it not only interesting, but easily accessible with ordinary appliances, and within easy reach of London, so that a few summer Saturday afternoons will be sufficient for the work.

I would again strongly impress upon all our students the great advantage to be derived from competing for the various prizes, intelligent study of existing work being of all things the most essential to the success of an architect, and may I remind them of the importance of studying the construction and indicating the joints of wood and stonework carefully and correctly upon their drawings. It would please me very much to see the number of competitors for each prize largely increased.

One cause of complaint which I made last year you have removed entirely. The attendances at our fortnightly ordinary meetings have been very good, the discussions frequently quite animated, and this has afforded me much pleasure. My thanks are specially due to the members of the Discussion Section for their valuable assistance in the matter, and to the various gentlemen who read the exceedingly interesting papers, which, doubtless, were in a great measure the cause of the improved attendance. If you examine the Brown Book you will see in the Syllabus of Meetings that our papers for this Session are, if possible, of even greater interest than those of last, and it is to be hoped you will show your appreciation of this fact by attending in even greater numbers. You will find papers on subjects purely artistic and subjects which are more particularly practical; amongst others, we have provided for your delectation one in which "Specifications" are treated of from two points of view—the builder's and the architect's. The names of Messrs. Walter Crane, Statham, and Pite, Stirling Lee, John Belcher, and Pomeroy, are sufficient guarantee of the quality of the material prepared for you. Might I suggest that you should look up the various subjects mentioned in the Brown Book before the meetings, and come prepared, not only to ask questions, but to afford information.

One of our most popular lecturers has gone from amongst us during the last few days. John Loftus Robinson, hon. amateur photographer to the Architectural Association, died on the 12th of this month, of typhoid fever. For those who knew him well it is difficult to realise that we shall see him no more in this world, never more hear his infectious laugh; for of all men he seemed to have a superabundance of life, health, and good spirits. On the annual excursion he will be immensely missed, for his never-failing flow of amusing stories and the enthusiastic manner in which he threw himself into every kind of fun, helped largely to make the excursions the great success they have been. His photographic records of each visit were most valuable, and he always exhibited the greatest energy and industry in making them. He was the first President of our Camera Club. To all here he was known by his amusing lectures, containing most interesting and valuable descriptions of the parts of England visited by the Association, superbly illustrated as they were by views produced from his own photographs. It will be impossible to fill up the blank his premature death has caused, and very long before his memory is forgotten.

We have also to regret the recent decease of Mr. Wyatt Papworth. He was always a good friend to the Architectural Association, and to his kind offices we are indebted for the generous donation of 50*l.* from the Clothworkers' Company to our general fund.

During last Session the Association was actively employed in the consideration of the new Building Act for London, for which purpose a special sub-committee was formed and held frequent meetings. We entered an appearance against it before the Committee of the House of Commons, and made a determined effort to obtain the abolition of the clauses respecting parapets to party-walls so far as relates to dwelling-houses. In this work our past Vice-President, Mr. Caröe, took a very active part, and spared neither time nor money to achieve our ends. In the opinion of most impartial observers he fully proved his contention that there is no necessity for carrying party-walls above the roofs of ordinary dwelling-houses, but with the present and late heads of the Fire Brigade against him we failed to carry the point. This is much to be regretted, for all of us, especially those who live in the suburbs, or daily traverse them in the train, must know how extremely unsightly they are in small houses, and what constant sources of expense and damage to their interiors. Although we failed in this point we were more successful in others, and we may at least congratulate ourselves that the new Act is a great improvement upon its predecessors, and removes many irritating restrictions under which architects suffered.

Very much time and consideration have been given by both the Committee and a special Sub-Committee to the scheme originated by Mr. Owen Fleming, for the better technical education of London workmen employed in the building trades. Our communications on the subject with the various City Companies, the trades-unions, and other bodies have received general approval, and with your consent a preliminary Conference will shortly be held, at which all the above-mentioned bodies will be represented. When the subject was first broached, the paper *London* was good enough to criticise our action with a good deal of disfavour; but as it was evident that it entirely misunderstood our intentions, no one troubled to reply. They seemed to think it was an endeavour upon the part of architects, whom they were good enough to call "a most notoriously ill-educated profession," to patronise the workmen, and advised us to look to ourselves first. Well, no one can say that the Association has neglected the education of architects. That has been our great object for over fifty years, and for a good many years past we have been fairly successful. Our system is not yet perfect, and probably never will be, but it is as good as we know how to make it for the present, and we shall endeavour to improve it still more as time goes on. So having done our best for ourselves, we naturally desired to help the workmen with whose co-operation we are beautifying more or less, according to our abilities, the face of Great Britain. We have no desire to patronise them (why should we?), but merely to treat them as fellow workmen with a common object. In helping them we are helping ourselves, for beautiful workmanship may go far to redeem a bad design, while a good design may suffer immensely from bad workmanship. The architect is the chief workman, but absolute success in any building can only be obtained by every workman of every trade employed upon it doing his very best, and uniting in a common effort to make the building in all its parts perfectly beautiful and perfectly strong. It is in this spirit that we are approaching the Conference, and if, as I believe, the other workmen understand this, we may hope to produce some beneficial results.

Gentlemen, in my address last Session, I ventured to give you some advice upon various matters connected with our art, profession, or trade, and the different methods of practising it. Various papers were good enough to print my remarks, and now I can refer you to them, and say, like the gentleman who desired to economise time in his devotions, "them's my sentiments." I have no desire to retract or alter anything then said, but there are one or two points upon which perhaps you will allow me to say a little more.

It is within my recollection that I advised young architects—by which I mean *very* young architects, for all architects under sixty are young—to take any work that may chance to come their way, so long as it be honest and at all remunerative, whether it be "light and air" cases, "dilapidations," sanitary work, or any other lowly undertaking. As a fact, these things pay very much better than more pleasant and artistic work, as may be easily seen by comparing the incomes earned by the lordly surveyor with those made by the mere architect, and the palace inhabited by the former with the humble home of the latter. I also ventured to advise the aforesaid very young architect to pay no heed to the discussions as to whether his calling be a trade, a profession, or an art, but to simply do his level best in whatever work he undertook.

But now I want to remind him that although the surveying work referred to is by no means to be despised, and is indeed very profitable, that it is only to be regarded by *him* as a means to an end, and that, let it be called what it may, architecture not only *is* an art, but the greatest amongst arts. It happens that it is not what may be called a popular art, and it neither obtains honours, nor indeed any recognition from royalty or the other powers that be, nor does it command the same remuneration from the British public that the arts of painting and sculpture do. But this, considered in the right light, may possibly be an advantage. A well-known ecclesiastical writer has put it on record that "the love of money is the root of all evil," and this is most true so far as it relates to art; indeed, it might be said that "the love of money is death to all art." Now, a successful painter is very soon in receipt of a large income, is invited into society, and in consequence becomes an R.A., and more or less of what is vulgarly called a "social swell." Then comes the end, so far as his art is concerned, for to keep up his newly-acquired position he paints not what he knows to be good, nor the best that is in him, but what he knows will sell, pot-boilers in fact, or supplements for the Christmas numbers of the illustrated papers, and so keeping his position he probably degrades his art. Ye cannot serve *Art* and Mammon. Now we are not, at least not yet, beset with these temptations. The public does not run after architects and compete for the honour of employing them. It would never occur to the vast majority of them that architecture is an art, although we may gratefully admit that the number of the intelligent few who do so regard it is on the increase. Very few indeed know a good building from a bad one, and they pay us our 5*l.* per cent. commission, equally willingly or unwillingly as the case may be, whether it be for designing a brick warehouse or a church full of elaborate detail. The very method of payment is obviously against our acknowledgment as artists by the public—they are more likely to class us with auctioneers, house agents, brokers, and other individuals paid by commission in a like manner. No, when the great British public speak of an artist they mean a painter, or possibly a photographer, but certainly some one who makes pictures that can be put in gold frames (made in Germany), and hung upon the wall. To them picture-making is art, and pictures appeal to them because they can, if the story told by the pictures be sufficiently clear, understand them, and then they buy them, and the manufacturers wax exceeding rich. But very few, comparatively, of the public care about or understand sculpture, and still fewer architecture, which is quite sufficient proof that of the three arts, architecture is the greatest, sculpture the next, and painting last. But the public reverse the order and pay accordingly.

And so, as we are not likely to attain to either riches or glory by our work, it only remains for us to work for the sake of doing good work, work that shall be an honour to our time and which shall be appreciated in the years to come.

If you consider the work of an architect you will see how responsible it is, and how careful we

ought to be to carry out to the very best of our ability all that is entrusted to us. Our work is necessarily conspicuous, and its influence, for good or evil, correspondingly greater than that of a picture or statue hidden away in some gallery or church. Statues and pictures must generally be the property and delight of the more or less rich, our work is for all, from the richest to the poorest. Upon it depends in a great measure the appearance, and even the health, of our towns, and foreigners form their opinion of the country largely from the beauty or otherwise of the buildings. The words of the poet that "a thing of beauty is a joy for ever" is specially true of good architecture; but what is to be said of the bad? Doctors have this great advantage over us, that when they make a mistake it is promptly buried, while ours remain a constant reproach, possibly for centuries.

Our own motto, "Design with Beauty, Build in Truth," fairly expresses the whole duty of an architect, and happy is he who can do it. The question of what constitutes the beautiful in architecture is more than difficult to answer. There is beauty of form, mass, and outline, beauty of colour and material, beauty of detail. Failure in any one of these mars the building, and but few men can hope to attain all.

As regards beauty of outline, it would seem that a change is taking place in our ideas. Not so long ago picturesqueness was the great aim of most architects, and I well remember the mayoress of a considerable provincial town seriously informing me that a leading builder of the town (naturally an authority on the subject) had imparted to her the one way to make a building pretty, which was simply to "cut up the roof as much as possible and use plenty of iron cresting." This opinion was once no doubt more or less generally acted upon, but lately men have learnt once more that long unbroken lines and large masses of roof and wall impart a dignity and repose to buildings not to be obtained in any other way. Unnecessary breaks in the roof of a building are to be specially avoided, for they are expensive, constant sources of danger from rain and snow, and being meaningless, are certain to offend the educated eye.

In the matter of colour, one is the less likely to go wrong, probably because the opportunities for doing so are more limited; moreover, in this respect time is good to us, excepting in very smoky towns. In London there can be no happier combination than red brick, Portland stone and Westmoreland slates for the exterior of buildings, and indeed they would be fairly safe anywhere; but there are many other building-stones of great beauty of colour, and both tiles, shingles and lead have good claims to consideration as beautiful roof-coverings. On this head I may well refer you to the valuable paper on "Colour in London Architecture," read here by Mr. Beale during last Session.

Of the various beautiful colour effects to be obtained internally by the use of marbles, alabaster, and glass, it is impossible to speak here. I would simply say, avoid violent contrasts, do not dot slender shafts of dark marble about an otherwise almost white interior, as one not unfrequently sees done in modern churches, and make all the use you can of British materials. Probably a good many people are unaware of the wealth of red, green, and grey marbles to be obtained in our own islands.

Beauty of detail, is, perhaps, the most difficult of all to obtain; certainly nothing more marks the distinction between good and bad architecture than the quality of its detail. The tendency of modern times has been to overload buildings with ornament of all kinds, many important buildings having been thereby spoiled. "When in doubt, turn on the carver" seems to be the principle on which many architects work, and no more fatal mistake can be made. Simplicity and breadth are the great things to strive after, and nothing more helps the appearance of a building than abundance of absolutely plain wall surface. What is more beautiful than the effect of sunlight upon a large mass of unbroken wall, where the ever-varying tints of good brick or stone have a chance of displaying themselves? Have carving by all means, but see that it is the best obtainable, and then probably the cost of it will prevent your having too much. Concentrate it, too, in masses, and do not spot it all about your elevations; then its richness gives value to the plain wall surfaces which by contrast add to the effect of the carving. It is a good plan when you think you have finished your elevations to go carefully over them again and see what features you can omit, and as you grow older you will probably find that more and more can with advantage be omitted. It is quite possible to design a noble building which shall be entirely free of any (so-called) ornament whatever, and owe the whole of its beauty to fine proportion and materials.

So much then for designing with beauty. It is granted to but few men to be able to do it, but we can at least all try. I think it was Sir Joshua Reynolds who said that "genius is merely the capacity for taking infinite pains," and the bold assertion, although like many other similar remarks not entirely true, yet contains a great deal of truth. A man who, really loving his work, sticks to it unflaggingly, always doing his best and losing no chance of improvement, is sure in the end to produce work worthy of respect, even though he be not, and never can become, a genius.

To "build in truth" is simpler, and, requiring but good common sense, is within the reach of us all. As I understand this part of our motto, it means simply that we should use each material in the proper and appropriate manner. It is not building in truth, for instance, when one designs what professes to be a half-timber building and executes the timber in cement, as a good many architects have done. This may be artful, but it is not art, in fact it is merely a poor fraud, by no means justified by the fact that our London and many provincial building regulations bar the use of timber in this manner. A very pleasing front can be made of stucco, used as stucco, as Mr. Collcutt has shown us at the other end of Fleet-street. The use of cast-iron to imitate wrought-iron is another common fraud, and one that is quite unnecessary, because cast-iron used in the proper way can be perfectly satisfactory and beautiful, as may constantly be seen in old work. Indeed, effects can be legitimately obtained with cast-iron that it would be difficult or at least extremely costly to get in wrought. It is unnecessary to multiply instances; all that needs to be said is that every material must be used honestly, not pretending to be what it is not, and so it is easy to build in truth.

It only remains therefore to consider how best a young man may learn to design with beauty, because this is the one great business of an architect.

Well, first of all, he has to decide whether he really is fitted to be an architect, and whether he had better not turn his attention to something else. It is extremely difficult to understand the reasons which actuate many young men in their selection of the calling of an architect. Some do it under the mistaken notion that it is a genteel profession, whatever that may mean. They will soon find out their mistake, and my advice to them is to become solicitors, and so acquire the advantage of being declared to be gentlemen by a special, and often necessary, Act of Parliament. Others join us because their fond parents discover in them a "taste for drawing." Unfortunately, that by itself is a very small qualification for the practice of architecture, although of course it is a most necessary thing to possess. Possibly he might do better by becoming a draughtsman for an illustrated paper, or even a mere painter. One of the funniest reasons for becoming an architect that ever came under my notice was that it was "a nice clean business." This reason was given by a young gentleman who favoured me with a call with a view of entering my office, and who at the time was acting as assistant to a hairdresser. Thinking I was upon the point of bringing out a hitherto suppressed genius, I asked if he could draw pretty well, but was somewhat staggered by the reply, that he "did not know, for he had never tried." So I strongly persuaded him to give up the idea, which I have reason to believe he did, and this same advice I give to every young man unless he is quite sure of his heart being in the work. Unless it be, the whole thing must necessarily become the most dreadful drudgery, for probably no other profession requires so much right-down hard work as ours, if there is to be any chance of ultimate success. A man possessed of a small income and influential friends may, indeed, obtain a large practice, and, with the help of clever assistants, carry it on successfully, without having the least ability, or love, for the work, but, though he may thus become a successful tradesman, he is certainly not an architect. Of course, however, the public will not realise that; so with plenty of assurance, some good luck, and a little entertaining, he may possibly in time become even an R.A.

Supposing the imaginary young man to have made his decision, however, to have become articled in a fairly good office, to have been admitted to our Association, and to have joined our classes and Studio, then the one and only way to learn how to design is by the constant study of existing work. I say existing work advisedly, because it is my belief that the study of modern work is as necessary, and more useful, perhaps, than that of old work. Of course, he must study old work, that goes without saying, but by all means study modern buildings as well. The old men undoubtedly acted upon this principle; they saw what had last been done, and then proceeded to make some improvement upon it, and if we work upon these lines architecture will become more and more a living art. It is my very strong belief that there are amongst us now men capable of doing work better than any done here in the Middle Ages; indeed, I often doubt whether we should so much admire some of our famous old work if we could see it "white from the mason's hand." Take the west fronts of Salisbury and Wells Cathedrals, for instance, two of the most admired productions of the Middle Ages. Worn by the hand of time, beaten by the winds, washed by the rains, and baked by the sun of centuries; saturated with religious sentiment and surrounded by the glamour of romance, they are most beautiful, and their contemplation fills one with delight. But if they could be done by a modern architect, and stand before us brand-new, with all their mouldings clear and sharp, and their every detail as it left the mason's hands, I do not hesitate to say they would receive very much unfavourable criticism from our shining lights. Therefore, I repeat, study old work, but do not fail to study new. There is something to be learned from it all, and though a great deal may be useful only in showing us what to avoid, there is much, very much, that is well worthy of our admiration. Take Mr. Norman Shaw's New Scotland Yard, for instance, and see how that fulfils every requirement as to simplicity, breadth, proportion, and colour. Look at the ecclesiastical work of Messrs. Gilbert Scott, Bentley, Bodley, and Pearson. Note especially how the latter obtains beautiful results, sometimes with scarcely any ornament and no sculpture. On the other hand, look at the works of Sedding, and see how full they are of charming detail. I could go on with the list, for there are plenty more men, and young men too, capable of admirable work, but I leave you to finish it for yourselves; believing myself in modern work, I want you to do the same.

But whether studying old or really good new buildings, remember that you are not to think that by reproducing certain details of them you are doing the right thing. Quite the contrary. It is the spirit you have to strive after, the life that is in them, the evident enthusiasm and love for the work which they all show so plainly. These are not the buildings that tradesmen-architects produce, nor is the 5*l.* per cent. commission what their designers had in view when they produced them. That 5*l.* per cent. is a curse of our calling, and probably does us more harm with the public than we realise. You must not trouble as to whether your work is going to pay financially or not; enthusiasm is what you want, fiery enthusiasm that will carry you through days and nights of arduous toil and through years of disappointment. Spare no time, nor thought, nor labour upon your work, and then, though you may never earn the wages of a commercial traveller, and have no chance of realising the fortune of a stockbroker, you will be repaid by the knowledge that you have done good work, work that may give pleasure to generations of your fellow-men, when the stockbroker and all his ways are forgotten or only remembered with horror.

Last year, in making some reference to the examinations held by the R.I.B.A., I said that it seemed to me that at least they could do no harm, so long as they are regarded merely as the means to an end and not the end itself. Whatever you do, do not get the idea into your heads that the object of your work here is to pass these examinations, more or less creditably. The preparation will do you much good, and the subjects you have to get up are those with which all architects should be acquainted. But remember the knowledge so gained is absolutely the minimum you must have to carry out your work decently. An architect must be a student all his days; no matter how long he lives, there will always be more for him to learn. Some changes for the better have been made in the manner of the examinations since my reference to them, notably the devotion of two days to the matter of design, and the announcement some days previously of the subject of the design. I am told the examinations are going to improve the status of the architect, give him a better social position, and procure him more considera-

tion from the public. Very likely they will, and so far so good, but these are matters of very small importance after all. Perhaps by and bye we shall all be registered, and then we may positively claim rank equal with plumbers and surgeon-dentists. It is all melancholy humbug in my opinion; an architect needs no such artificial social position; his only business is to do good work, and, doing this, he will readily obtain from educated people, people of taste, as much consideration as is good for him. He knows if his work be good that there is nothing nobler, nothing more elevating that man can do, and this should be enough for any reasonable man.

Last year, also, you were good enough to approve by your smiles some remarks I made upon two other subjects—competitions and ghosts—and there is but little more to say about them. What I said as to the necessity of making it one condition of every competition that the author of each design should send with his drawings a formal declaration that the work is absolutely his own, has since received very strong confirmation. There have been two competitions during the year for municipal buildings in London, and in each case the successful design was entirely the work of ghosts. Now, for a man to send in, as his own design, the work of another, everyone must admit to be a downright fraud, and the man so acting ought to be punished by immediate disqualification. It is a matter that the Institute should take up strongly for the credit of the profession, as nothing can be more damaging to us as a body than the knowledge that this sort of thing is done. The ghosts themselves are by no means free from blame, but I am not prepared to sit in judgment upon them. They do their work honestly, for a more or less nominal sum, but their employers, who do *not* do the work, and *could not* do it, take all the credit and all the profit, to neither of which have they morally the least right; and after all, if the design be a good one, as it may or may not be, it is certain to be more or less spoiled in the carrying out, by the utter inability of the reputed architects to properly detail it.

Gentlemen, I have spoken at much length, be it always understood, to *young* men, and have little more to say. I have endeavoured to give you good advice, and you will act upon it or not just as your views happen to agree or otherwise with mine. Upon one point, however, I hope we are all agreed, and that is to work together, shoulder to shoulder, for the good of the Association. See that there be no petty jealousies among us, no envying, and no malice, but good, honest, healthy competition, as to who can do the most, not only for himself, but for the whole body, to raise the standard of work, and to maintain, unbroken, as handed down to us by our illustrious predecessors, the glorious traditions of the Architectural Association. Remember the words of our very own immortal and up-to-date bard:—

"Times may alter and years go by,
But we still the A.A. love,
Build in truth is the flag we fly,
Design in beauty above;
Years may roll and centuries fade,
Still o'er our heads shall play
The glorious flag of the Old Brigade,
The Standard of the A.A."

Mr. W. H. Seth Smith said he had pleasure in proposing a vote of thanks to Mr. Mountford for his admirable address, which he felt sure would be looked upon as an inspiring and practical one. On the question of admitting women to the classes, he (the speaker) had happened to differ from the majority of the Committee, and yet he agreed to a great extent with the policy which had been pursued. He was fully in favour of admitting women to some of the privileges of the Association, such as the lectures and classes, but he would hesitate to admit them to the common rooms. Mr. Mountford had referred to the curriculum of the Association, and it was most gratifying to find that 70 per cent. of the members were students of the classes. He scarcely thought they could not have expected a more satisfactory result, but, at the same time, they looked for improvement every year. On the subject of art, their President's remarks were very enthusiastic and practical. As a teaching body, they might certainly claim to be more enthusiastic in favour of art than any other body or college in the metropolis. Not only did they go in for art most enthusiastically, but they were able, from their experience as practical men, to give it that particular direction which was so essential to the scientific work of an architect. The address had also alluded to their "foreign policy,"—to the action they had taken in reference to the Buildings' Act, and the modifications in that Act, which their representations would, to some extent, have influenced. The question also of the Workmen's Conference was a very important one. He had the honour of being on both those Committees, and he did not believe they could over-estimate the importance of this question of the education of the workmen, if their works were to be all that their ambition would have them be. Then came advice to the students, and what could be more practical than the recommendation to study modern work of the best kind. They owed great thanks to the President for again pointing to that important subject. As to the method of remuneration, he felt most strongly with Mr. Mountford, that it should be altered, and he hoped it would be the work of the Association to bring great pressure to bear in all directions in furtherance of that important reform. He was glad that the Association had at its head a practical and able man like Mr. Mountford, and members should be very grateful to him for accepting so arduous a task for the second time.

Mr. Aston Webb, in seconding the vote of thanks, congratulated the President on commencing his second year of office. It was the highest honour the Association could bestow upon any member. He (the speaker) believed that the same wise course which had been pursued in the past was still being followed. Those who were outside looked upon the extensive scale on which the new education scheme was started with something like awe, but the fact that it had been curtailed to some small extent only showed how well it had been carried out. One point in the address especially appealed to him, because he had more than once ventured to mention it there, viz., the advisability of studying work by modern architects. He believed that study was being more and more carried out, and there was never a more favourable time for it than the present. One was sometimes asked after erecting a building what was its style; one was almost compelled to invent a style at the moment to satisfy the questioner. Fortunately, however, it was being considered less and less necessary for the architect to follow a particular style. The present seemed to be the most delightful time for the young architect to enter on the art of architecture. He had the opportunity of studying the old styles, and when he commenced his practice he would be able to give rein to his imagination. The buildings erected by those architects whom the President had mentioned would become the nucleus of tradition, which the young man might follow, unhampered by the necessity of style, and this natural development would interest far more than the repetition of old features or styles. The mere repetition of old work could not raise enthusiasm as it once did, but only that which was individual work. The President had referred truly to the serious and important nature of an architect's work. It was not knocking off a little sketch, but referred to things which had to be executed in brick, and stone, and marble, and were meant to last. The more they could realise how the work would look when executed, and not merely how it appeared on paper, the better it would be, for their efforts would be judged not by the personality of those who had done them, but by the results. There was always something pathetic in looking at a building when the man who had designed it had passed away. As one looked at the portions of a building, and saw the infinity of work put in by the designer, one could still see the living spirit left in it, even although the architect was dead. If they would follow in the same path, they must secure for their buildings the element of permanence. He had sometimes noticed that the hand of time was not altogether impartial; in the case of bad work it appeared to smear and dirty it, and to make it worse and worse, so that the older it got the more wretched it looked. But with a good work the hand of time seemed to touch, and tint, and improve it, so that it became more and more beautiful. The only thing which would secure permanence in a building was that it should have some beauty of form or colour, which would make it worth while for people to retain it.

Mr. Leonard Stokes supported the vote of thanks, and said that the advice given them by the President to study new as well as old work was excellent, and if the members would follow it and take Shaw, Bodley, Bentley, and such men, and *improve upon* their work, they would have done something. He believed that the mistake was often made by young men of imagining that everything old must necessarily be good, when they ought to look at old work with something like the same discrimination as they looked at the new. He should like to congratulate the President and the Committee on the excellent list of papers they had got together for this year; it ought certainly to produce a good attendance of the members. He was glad to hear that the new scheme was working with a large amount of success. They had not been told anything about the vexed question of new premises, although the Committee had been looking for them for the past four or five years. It was better, perhaps, however, to put up for a time with premises which were too small for their requirements, than to take others before they really knew quite what they wanted.

The vote of thanks, on being put to the meeting, was carried by acclamation.

The Chairman thanked the members for the manner in which they had received his address. He added that, of course, they must discriminate as to what modern buildings they were going to study, and he had endeavoured to give a few suggestions as to what were good buildings. They could not go wrong if they studied the buildings illustrated from time to time in the "A.A. Notes." These illustrations were necessarily limited in number, as they had not the money to pay for more; but the scarcity of the illustrations had one good point—they were all well worthy of study.

The proceedings then terminated.

ARCHITECTURAL SOCIETIES.

Birmingham Architectural Association.—On the 26th ult. the twentieth session of this Association was opened with a conversazione, exhibition of drawings, and smoking concert, Mr. W. Henman, A.R.I.B.A., the new President, occupying the chair. After a few introductory remarks, he presented the prizes to Mr. W. J. Prichard for the best set of measured drawings prepared from sketches made on the sketching excursions, to Mr. Gerald McMichael for the best essays upon the subjects dealt with at the construction classes, and to Mr. E. B. Clarke for the best descriptions of buildings in course of erection visited by the members during the past session. This section forms an important part of the Association's educational programme. The musical portion of the evening's entertainment was then proceeded with. The drawings were a very interesting collection, kindly lent for exhibition (which remained open until Tuesday morning) by the following architects:—Messrs. Ernest George & Peto, H. H. Wilson, James Brooks & Son, Ernest Newton, Francis Masey, Arthur Bolton, Reginald Blomfield, E. J. May, Andrew Prentice, R. A. Briggs, Gerald Horsley, Phené Spiers, H. Hennings, W. Fleetwood, and Douglas Fordham. Drawings were also lent by Messrs. E. C. Bewlay, Arthur Harrison, Victor Scruton, J. A. Swan, A. J. Dunn, J. Ward, and others of Birmingham.

Carlisle Architectural, Engineering, and Surveying Association.—The annual general meeting of this Association was held in the Town Hall on the 24th ult. The business consisted of the election of various officers: Mr. C. Lonsdale being elected President, Mr. E. F. Ruthven and Mr. F. J. Nickols, Vice-Presidents. A letter of resignation was read from the late Hon. Sec., Mr. J. Rush Dixon, now residing in Walsall, and it was resolved that the best thanks of the Association be forwarded to Mr. Dixon for his former able services. Mr. E. B. Newton, City Surveyor's Office, was appointed Hon. Sec. and Treasurer. The annual balance-sheet was read, showing that financially the Association is in a most flourishing condition. The opening meeting of the Session 1894-5 will be held in the Town Hall, at 8 o'clock p.m., on Wednesday, November 7 next, when the President will read the opening address. A satisfactory list of papers has been arranged by the Hon. Sec. for the ensuing Session.

The Parliament Hill Fields "Tumulus."—The work of excavating the ancient mound, or "tumulus," in Parliament Hill Fields, adjoining Hampstead Heath, was commenced on Monday, under the personal supervision and direction of Mr. C. H. Read, of the British Museum. About one-half of the mound has now been removed, the soil thus far consisting of a loamy sand; but the only object of interest yet found is a large old-fashioned musket bullet. Whatever the result of the present investigations, the mound will be restored, with the same material as that now being removed, to its old condition.

Illustrations.

BATH ABBEY.*

THE early Monastery of Bath, founded originally for secular canons, was destroyed in 1088, and on the granting of the monastery by William Rufus to Bishop John of Tours, or Villula, Bishop of Wells, a new church was commenced by him in preparation for the removal of the Somersetshire See from Wells to Bath.

Of this Norman church we have some interesting remains, and from these it is clear that it was on a far larger scale than the present building, the nave of the Norman church being nearly of the same length as the whole of the present church, the central tower and eastern arm occupying the space eastward of the present choir, now a roadway. The church commenced by John de Villula was completed by Bishop Robert, but in subsequent centuries the monastery became much neglected, so that when Dr. Oliver King was translated from Exeter to the See of Bath and Wells in 1496, he found the church in a sad state of ruin.

A new church was commenced, the west front being slightly to the west of the Norman west front. Its design has been attributed to a dream or vision of the Bishop, who is represented as having seen the Holy Trinity with angels ascending and descending, while a voice cried, "Let an Olive establish the Crowne, and let a King restore the Church."

How far Bishop King completed his work does not now appear. He died January 24, 1503-4, and his work was carried on by Prior Birde. Some considerable progress must have been made with the choir, as Birde built a chantry for himself on the south side of the sanctuary. He died in 1525. His successor, Prior Holleway, although he endeavoured to complete the work, was compelled to deliver up his monastery to the King, June 27, 1539.

Cardinal Adrian de Castello would seem to have been a contributor towards the vaulting of the choir and its aisle, and his arms are still to be seen. Of the other Bishops between the time of Bishop King and the Dissolution—Cardinal Wolsey, Bishop Clark, and Bishop Knight—none seem to have contributed to the completion or adornment of the church. After the Dissolution the church was offered to the town for 500 marks. This, however, was refused, and in 1560 Edmund Colthurst "made the city a present of the carcass of St. Peter's Church, with the ground upon the east, west, and north sides of it," and the old abbey house was likewise sold.

Various attempts had been made to revive the interest in the church, but it was not until Bishop Montague's time that the building was completed, the vestry was built by Sir Nicholas Salterus, and many others contributed towards the glazing and paving. A long list is given in Appendix V. of Britton's "Bath Abbey Church." The date of its completion was about 1616.

Although late in date and poor in many of its details, there is no lack of dignity in its general exterior effect, and the interior is very imposing.

It is symmetrical on plan, having a nave of five bays with aisles, and a choir of three bays, also with aisles. The central tower is oblong, and the transepts are narrow and aisleless. In the angle of the south transepts and choir is a small vestry, which is in the parish of St. James. The aisles of the choir do not terminate in the usual way, but have porches. From the remains of the Norman work this unusual planning may very possibly have been suggested by the earlier work and the use that could be made of the old foundations. There are three doorways in the west front and two in the south aisle. Although some time elapsed between the foundation of the present church by Bishop King and its completion by Bishop Montague, the original design was evidently adhered to, and the effect is consequently of a church built at one period. This has been further carried out by the restoration by the late Sir G. G. Scott, who completed the vaulting of the nave and its aisles to correspond with that in the choir. Restoration also included the placing of pinnacles on the tower, and the building of flying buttresses to the nave to resist the thrust of the stone vault. The preparation for these buttresses is shown in old engravings of the church. During the restoration the foundations of the Norman church were discovered. We shall refer to these in detail later.

The church, though at one time partially hidden by buildings, is now isolated, and a paved space surrounds it on all sides. To the west are the old Roman Baths, and the clearing away of the buildings which covered these has opened out a fresh view of the Abbey Church. This view, taken from the roof of one of the present baths, we give this week. In close proximity to the Roman Baths was a temple of Minerva, which stood west of the site of the present Abbey Church, and the ground was occupied by the Church of St. Mary-le-Stalls, now destroyed.

The west front, said to represent the vision of Bishop King, is the most striking point in the exterior. A large seven-light window occupies the centre over a deeply-moulded doorway, and flanked by octagonal turrets. The aisles have doorways with four-light windows over. On the face of each of the turrets is sculptured a ladder with angels ascending and descending, and at the bottom are figures in adoration. Canopied figures of the Apostles occupy the canted sides of the turrets, and the space between the great window and the low-pitched gable above is occupied by figures of angels, with the Trinity under a large canopy in the centre. Shields, now defaced, are also introduced, and probably bore the arms of Bishop King and those of the See.

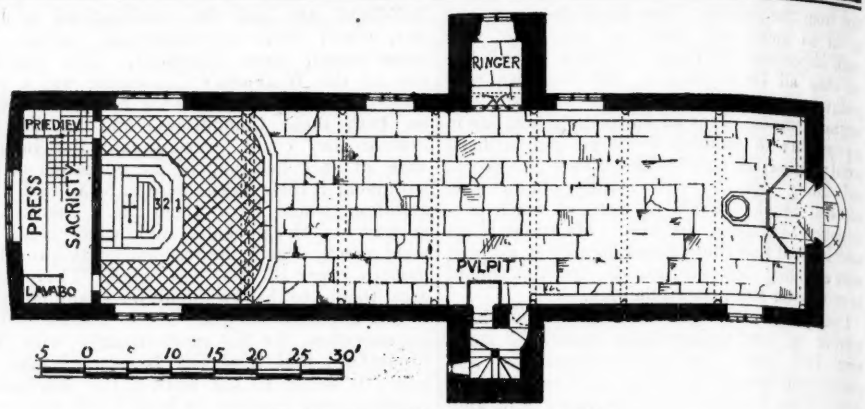
On the face of the aisle buttresses is an olive-tree springing from a crown, with a mitre over, in allusion to the name Oliver King. Over the west window of the north aisle are the words, "Dominus mea," and over that on the south, "Dominus oronis" in black letter. Flanking the central doorway are effigies of SS. Peter and Paul; the spandrels of this doorway have the emblems of the Passion. The doors themselves are of late date, given by Sir Henry Montague, Knt., brother of the bishop, and Lord Chief Justice of the King's Bench. They bear shields with the arms of the Montagues and the See of Bath and Wells. The nave is lighted by lofty five-light transomed windows in the clearstory, and five-light windows in the aisles with four centred arches. The same design is carried through the rest of the church. Each bay of the clearstory is divided by a pinnacle and finished with an open embattled parapet. The central tower is oblong, with massive angle octagonal turrets, and rises two stages above the roofs. On each face in each stage are two windows set in rectangular panels. Those on the first stage are blocked. The two centre lights of each of the belfry windows are pierced. The design of the choir and its aisles is in nearly all respects the same as that of the nave. The east window is of seven lights, with a square head. The angle-turrets are square on plan to the parapet level, and afterwards become octagonal. The design of this front is perhaps the least satisfactory part of the whole.

It must be admitted that the interior of this church is a great deal finer than the exterior. The design is very simple, but the large windows, the lofty proportions of the central alley, and the rich fan-vaulting of the roof combine to make a very impressive whole. Unfortunately, the organ-screen under the tower was removed at the restoration, and the interior has lost much in consequence. The fittings are new throughout, and most of the monuments are of little interest. Two, however, demand attention. The first, a Chantry Chapel, erected by Prior Birde on the south side of the high altar, filling the easternmost bay. It is of two bays, Late Perpendicular in style, resembling many other chapels of its date in details. The spandrels and cornice are rich in carving, and on the vaulting at the east end are the arms of Prior Birde, surmounted by the mitre and pastoral staff. On various parts of the chapel are the initials W. B. and a bird, in allusion to the name of the builder.

Still later in date is the second monument of importance—that of Bishop Montague in the nave occupying the second bay westward of the tower. It is of Renaissance design, and has a recumbent effigy on an altar-tomb, the sides of which have heraldic shields. The whole is surrounded by a massive iron railing. The only old glass remaining in the church is a series of shields of arms in the windows of the clearstory of nave transepts and choir, numbering about sixteen in all. They are apparently of Early seventeenth-century date, and are probably the arms of benefactors, many of whom contributed to the glazing of the windows.

During the restoration by Sir G. G. Scott, interesting remains of the Norman church of John de Villula were discovered below the present paving. They have been covered by gratings, and are now visible, about 5 ft. below the present floor level. They are shown on the specially-prepared ground-plan we here give. Beginning at the west end, we have the remains of a portion of the jamb of the Norman west door, and against the bench of the south aisle is a small column. Opposite the second and third columns of the nave arcade are remains of the Norman piers, with semi-circular columns in pairs on each face. A third pier remains on the north side of the sanctuary, and in the angles of the east porches and outside the eastern buttress of the aisles are the fragments of two large piers having a large circular column apparently three parts disengaged attached to the inner angle. These masses of masonry undoubtedly are the remains of the two western piers of the Norman central tower. From what remains we are enabled to obtain the following results:—The Norman nave was of eight bays. The central alley was slightly wider than that of the present church, but the walls of the aisles would seem to coincide. Allowing for the extra thickness of the Norman piers, this would reduce the width of the Norman aisles to about 13 ft., the present aisles being 4 ft. wider. The west front was a few feet eastward of Bishop King's front, and the western piers of the central tower formed the foundation of the eastern turrets and buttresses of the present choir. Eastward was the Norman choir, perhaps terminating in an apse, and occupying the space now a roadway.

* The series of the "Abbeys of Great Britain" is continued this month with illustrations of (No. VI.) "Bath." Particulars of this and of the three Cathedral series ("England and Wales," "Scotland," and "Ireland") will be found on p. i.



Design for a Village Church.—Plan.

DESIGN FOR A VILLAGE CHURCH.

THIS design was made as a study for a small village church or hamlet chapel. The materials intended to be used are brick and rough-cast for the walling, with stone dressings.

Of the two turrets, that on the north side contains the stairs, that on the south the bells, to which access is given by the bridge.

F. C. EDEN.

HIGH ALTAR, MOOSBURG,* BAVARIA.

THE drawing which we publish was exhibited at the Royal Academy this year by Mr. H. W. Brewer; it represents a very remarkable reredos of a church in Bavaria. This fine work is executed in red pine very richly painted and gilt; it is over 60 ft. high, and stands upon the stone dorsal of the high altar.

There are several points of interest about this reredos to which we will call attention.

In the first place the exact date is known—in fact, it appears upon the work 1462, also the name of the donor, Duke Louis "the Rich."

This reredos differs from most in Germany in the fact that it is not a triptych, nor is there any

* Sometimes spelt "Mosburg," but the double "o" is generally used to distinguish it from Mosburg in Styria.

appearance of its ever having possessed doors—in fact, it may be fairly concluded that it is now seen as originally designed.

Another very remarkable, and, we believe, unique feature, is the great triangular canopy or baldacchino projecting from the upper portion of the reredos. It would appear that the idea of the architect was to combine the ideas of a baldacchino and an open pierced reredos, and certainly he succeeded.

The little shrine over the altar is modern, but the doors of the cabinet enclosing it are beautifully painted by the elder Holbein (grandfather of the celebrated portrait painter). The back of this reredos is almost as elaborate as the front, and forms a different composition with a large picture in the centre, which is also attributed to the eldest Holbein; it may, however, be doubted whether it is not by Zeitbloom, or Burkair, whose works are to be seen in the cathedral at Augsburg, and other Bavarian churches and galleries.

The church at Moosburg contains a good set of choir-stalls, and one or two carved monumental stones, but has not much else of interest; nor is there anything in the town or immediate neighbourhood worth visiting. The churches are nearly all in the German-rococo style (the worst style of architecture that ever existed), the domestic work modern, and the scenery tame and poor. How this fine reredos has escaped is remarkable, as all others in the district were destroyed during the seventeenth and eighteenth centuries, and replaced by the most miserable quasi-Classical works. One would not have been surprised at finding a fine reredos on the Lower or Upper Rhice, Westphalia, in the Tyrol, or the Nuremberg district, but here it is quite solitary, and comes upon one as a surprise.

EGYPT EXPLORATION FUND.

THE annual meeting of this Fund was held on the 26th ult. at the rooms of the Zoological Society, Hanover-square, Sir John Fowler presiding, when the report for the year 1893-4 was presented, the most interesting portion of which related to the excavations carried on last winter by an expedition led by M. Edouard Naville, Mr. Newberry, and Mr. D. G. Hogarth, that was engaged in clearing the ruins of the great funerary temple known as Deir-el-Bahari, a small portion of which was explored by Mariette earlier in the century.

In the evening another meeting was held under the presidency of General Sir Ch. Wilson, to hear a lecture by M. Naville, which was illustrated by a series of lantern views reproduced from the photographs of one of the artists attached to the expedition, Mr. Howard Carter. The much more complete exploration of last winter proved, he said, the erroneousness of the reproduction of the Temple by Mariette, who had scarcely cleared one-third of the site, and it demonstrated that the monument consisted not of one but of a series of temples built upon three platforms or terraces rising one above the other, the third temple resting against and being partly cut out of the solid rock. It was not the work of Thothmes III., as some of the inscriptions, when superficially examined, imported, but of Queen Hatasu, his aunt and guardian, the daughter of Thothmes II., of the 18th Dynasty. Among the numerous inscriptions discovered by the expedition was one which expressly enjoined the people to obey "the king, my daughter," as he called the young queen, who was represented in all the sculptures in the garb of a male ruler, and generally with a great beard. This circumstance made it easy for the successor of Queen Hatasu, by erasing a few leading words in the inscriptions and by changing the cartouche, to claim credit for the splendid monument of which he appears to have been envious, although possibly he was partly actuated in making the erasures by a spirit of revenge towards his guardian, who perhaps subjected her ward to the iron discipline of a very imperious will. The inscriptions proved the daughter of Thothmes II. to have been a really great queen, who greatly extended commerce and encouraged art, particularly architecture, in her kingdom, and entered into international relations with surrounding peoples. She had fleets of ships, which traded on both sides of the Red Sea, but particularly on the African or Somali coast, representations of ships being found laden with the tusks of elephants, a special kind of monkeys, and exotic trees, which, on being transplanted, grew very well in Egypt. These ships brought precious metals, especially gold, and, as cuneiform inscriptions showed, Western Asia received great quantities of gold from Egypt and sent it back in the manufactured state to Egypt or Phenicia. They had found many evidences of commercial intercourse which was certainly far greater than we had hitherto supposed. When the inscriptions describing the naval intercourse of the period had been more completely studied, it would probably be found that many of what had been regarded as evidences of conquest were in reality the vestiges of trade and commerce. The art antiquities found, many of which were of the most exquisite workmanship, and which in age probably corresponded with the Early Mycenean period, could not fail when adequately investigated and studied to throw a flood of new light upon the relations between Greek and Egyptian Art. The tomb of Thothmes II. was quite unique. There was no other example in Egypt of temples within temples, and of colonnades so perfect as the two found in the second of the two temples discovered at the northern end of the site, the end opposite to that which Mariette had explored. At the end of the upper platform they had found many objects of unique interest, most of which were exhibited on the screen. Among them were a colossal head of Queen Hatasu, a great white altar, and an inscription which stated that the queen had built an altar of white stone, a rock-temple, the funerary chapel of Thothmes I., and on one of the terraces M. Naville had come upon one of the finest emblems of ancient art in existence. It was the side of an ebony shrine covered with ornaments on both sides, all made of little pieces of ebony, beautifully carved, each piece separately secured to an ebony peg. Among the most interesting of the architectural remains unearthed and shown in the photographs were several very perfect colonnades with quite Doric columns, which had sixteen-sided capitals, containing many of the characteristics of Doric capitals. One view showed a group of five of these columns, another of eight columns seemed intended to form part of a covered colonnade that had never been finished, and one complete colonnade presented fifteen rows of columns, having all the beauty of a Greek temple and resemblance to early Grecian architecture of the most striking character.

In the discussion which followed, Mr. Bayliss, Q.C., Sir Charles Wilson, and Mr. D. G. Hogarth, took part. The latter said M. Naville had in no way exaggerated the importance of the temple, which was one of the most extraordinary that had ever been discovered. There was nothing elsewhere like it. It looked like a number of temples built one on another. The whole history of the reign of Queen Hatasu was probably told in those temples. What had been discovered so far was of the greatest importance, but it was, perhaps, almost trivial compared with what might be expected next winter, for Mr. de Morgan, the director of the Museum of Gizeh, intended to have 1,000 men on the works. In response to a very cordial vote of thanks M. Naville said he hoped to have a great deal more to tell them of the matter next year.

NATIONAL FREE LABOUR ASSOCIATION.

THE second annual congress of the National Free Labour Association was opened on Tuesday at the Foresters' Hall, Clerkenwell-road, and was attended by delegates from Hull, Liverpool, Middlesbrough, Norwich, Newcastle, Southampton, Swansea, Dublin, Plymouth, Sunderland, and other provincial towns.

Mr. John Chandler having been elected to the chair,

Mr. W. Collison (Secretary) read a number of communications. The Marquis of Salisbury wrote, on the subject of picketing, that he concurred with the Association "in thinking that picketing as at present practised appears to be open to considerable objection in many cases where it appears to involve molestation and intimidation. This interpretation of the present law is certainly not in accordance with the views of those by whom the Bill was framed." Mr. H. H. Asquith, M.P., dealing with the same question, wrote that, while recognising the importance of the subject, he did not feel it his duty at present to express any opinion upon it. Mr. Herbert Gladstone, M.P., wrote that he was not aware that an alteration of the law in regard to picketing was necessary. A letter was also received from Mr. George Livesey, who enclosed a cheque for 20*l.* towards the work of the Association.

The report stated that the Association was now in a position to look back with considerable satisfaction on the labours of the past twelve months. During that period the necessity for the existence of such an Association was again demonstrated, because on five occasions a deliberate attempt was made by certain sections of the Labour party to crush out of existence, or to starve into submission, those bodies of workmen who had hitherto preferred to remain outside of the movement known as the New Trade Unionism. They believed that the conflict between capital and labour had by no means reached its climax yet; but if masters would only act unitedly, and stand by one another, as the Federated Trade Union were now doing, and, above all, if they would support and protect from injury those of their *employés* who were totally at variance with the present policy of the New Trade Unionism, they felt certain that the party which depended for its force upon intimidation, class hatred, and violence would receive a complete overthrow, for the great bulk of the working classes were completely sick of the meddlesomeness and tyranny which characterised the Trade Union officials at the present day. As to the Employers' Liability Bill, it seemed strange that the Association was alone in putting before the working classes the deliberate injustice inflicted upon working-men by the insertion of the clause forbidding "contracting out." The Association had held meetings and passed resolutions against the action of the Building Trades Federation, and in two months 5,764 bricklayers, carpenters, plasterers, masons, and labourers had been registered. No doubt a great blow had been struck at the organisation, which had done incalculable harm to the building trade of London. There were 16,822,165 persons employed in working for their living, and of those 9,786,073 were men over twenty years of age. Of these 1,109,014 were members of trade unions, and 8,677,059 were free labour men and non-unionists. At the end of August 228,000 seamen had been registered as free labourers. In the Metropolitan Docks the demand for tickets as free labourers had been so great that it had been necessary to limit the issue to the men for whom employment could be found. The numerical strength of the unions had decreased, in spite of the great efforts and confidence in the management of the agitators and self-seekers. During the past twelve months the number of workmen registered by the Association amounted to 11,540, thus bringing up the present membership to the very respectable total of 51,249. In reference to the suggested action of the London County Council in refusing to employ non-union men, the report stated that the Works Department admitted the truth of three cases presented by the deputation of the Free Labour Association, but denied the correctness of the other three; but since then a letter had appeared in an evening paper from one of the foremen in question, who acknowledged that he was in the habit of communicating with the various unions before giving applicants employment. This admission proved that the Works Department could not have made a very searching investigation into the cases brought before them, or a complete contradiction from one of their *employés* would not have followed so quickly upon their statement.

The Chairman said they were formed to counteract the tyranny of the new unionism. They did not object to combination in a legitimate form, nor was the Association formed to lower wages. They believed the best men would always command the highest wage, and the best men in the trades were in their ranks. They found that their manufacturing supremacy was leaving them slowly, and as thinking men they looked for the cause. In this connexion he referred to the large amount of ironwork that was being carried out by German and Belgium firms for English capitalists and with English money. He believed that nine out of ten strikes were needless, and if those who said they were the leaders of the working men had approached the masters in a right spirit the consequent misery might have been averted. That Association was the outcome of the struggle with the new unionism, and only those who had stood face to face with the tyranny exercised by that unionism could state what a real tyranny it was. The vexatious interference at the docks of those who knew nothing of the relations between masters and men was bound to result in most disastrous consequences to the country. The members of the Congress were working men who had left their work to attend; but of those attending the recent Norwich Conference, 25 per cent. had not worked at their trade for over fifteen years, and 75 per cent. had not worked at their trade for some considerable time; the only real workers were the miners, They must protest against England being made the "dumping-

ground" for starving aliens. Could they not do something to re-establish the friendly relations which formerly existed between capital and labour? Surely there was not such an impassable chasm? If they did not bridge that chasm over the trade of the country would dwindle away. He believed they could do something towards that, and set an example which would be an example to the world, and which the world would profit by.

Mr. C. Godden moved the following resolution:—"That in the opinion of this Congress the senseless and abortive strikes which have occurred in many branches of industry throughout the country, have had a most disastrous effect upon the living standard of the wage-earning classes, and are mainly the cause of the present stagnation of trade and consequent want of employment." He said he had been a victim of the coercive tyranny of trades unionism for the last four years, and that during that time he had been persistently persecuted and boycotted by the union representing the painting trade. He was prevented from doing work for Captain Boyton, at Earl's Court, and was threatened outside Lillie Bridge Ground. He went in to work there, but 1,500 men threatened to strike, and after working a day and a-half he was forced to come out, and at the time he was absolutely starving.

Mr. G. W. Clasper (Newcastle) seconded the resolution. He said that if trades unionism was not checked, much of the trade of the North of England would be lost. During nine months 3,000 workmen in Newcastle had joined the National Free Labour Association.

After a brief discussion, during which the evils of strikes were referred to, the resolution was adopted.

Mr. Beale (Finchley) next moved:—"That, in the opinion of this Congress, no alteration in the 'Conspiracy and Protection of Property Act, 1875,' will be satisfactory which does not so provide that, while recognising the legal right of workmen to picket during strikes for the *bonâ-fide* purpose of giving and receiving information, picketing in such numbers as must inevitably terrorise those who may be willing to work should be prohibited."

This was seconded by Mr. Ritson, of Hall, and passed, after discussion; after which the Congress adjourned for the day.

The second meeting of the Congress was held on Wednesday, Mr. John Chandler, President, again occupying the chair.

The Chairman, in opening the evening's proceedings, said that there could be no question that these meetings promised to lead to still greater things. Those who represented that Association did not despise the day of small things, but they did not intend to rest where they were. The Association commenced with a few men who combined to resist the tyrannical pressure that was put upon them; and he felt quite sure that the seed they had sown would continue to grow larger and larger, until at last it came to be a mighty oak that would overshadow all the mushroom unions which had lately sprung up, and had done so much harm to the cause of labour. The Association was going largely to extend the scope of its operations by establishing branches throughout the whole country. A great deal of tyranny had been exercised over the working-classes for some time past. The Free Labour Association had broken it down already to a large extent, and would yet break it down altogether.

Mr. Ellis, of the London and North-Western Railway Works, who said he did not represent railway workmen as a delegate, but appeared in the interests of labour generally, moved—"That this meeting, representing the vast majority of the working classes in the United Kingdom, enters a most emphatic protest against the reintroduction of an Employers' Liability Bill containing a clause forbidding 'contracting out,' and calls upon all workmen by their individual influence to support the House of Lords in throwing out a measure which deprives working men of their undoubted right to make better terms as to insurance against accident than the law now permits them to do, and one also which forces a workman to the expense of a doubtful and expensive lawsuit in order to obtain a smaller sum than would be awarded to him free of expense by his Mutual Insurance Society."

Mr. Foreman, of the Elswick Works, Secretary of the Association's Fund, in seconding the resolution, said the working men of Durham were fighting against the Eight Hours Bill just as they were fighting against interference with freedom of contract and action under the Employers' Liability Bill. With regard to the mutual insurance associations, he maintained that arrangements between employers and workmen were the best means, not only of securing compensation, but of minimising accidents.

Mr. Burrows, of the South Metropolitan Gas Company and Mutual Assurance and Compensation Fund, and Mr. Bashford, Honorary Secretary to the Mutual Assurance Committee of the London, Brighton, and South Coast Railway, also supported the resolution, which was carried unanimously.

Mr. Ritson, of the Free Labour Association at Hull, representing 11,000 free labourers there, moved, "That this Congress rejoices to learn that the free labour principles are making steady and certain progress amongst the industrial classes of the country, who recognise the necessity for the permanent maintenance of a free labour party so as to resist the ever encroaching tyranny and dictation of the Socialistic Trade Unions, and, further, that the Congress would welcome with pleasure any means tending to the establishment of more cordial relations between employers and employed, believing that it is not only for the best interests of both alike, but for the welfare of the trade and commerce of this country, that mutual confidence should exist between the two parties." In support of his resolution, Mr. Ritson said the supporters of this labour movement might be ostracised for adherence to free-labour principles, might be called by insulting names, and be talked about as men not worthy to represent the working classes of the country, but their vindication for the stand they were now making against the organised tyranny of the day might be safely left to those who followed them in the future.

The resolution, seconded and supported by Mr. Russell, of Glasgow, and Mr. Macauliffe, of Dublin, was carried.

Mr. Harold Stevenage, of London, moved:—"That in the opinion of this Congress the time has arrived when it is absolutely necessary that some restriction should be placed upon the immigration of pauper aliens to this country, and it is pleased to note that the Trade Union Congress has at last accepted the views that this Association has so long advocated in the matter; and further, that this Congress earnestly hopes the Bill restricting pauper immigration, recently introduced in the House of Lords, shall be allowed to become law, and desires that a copy of this resolution be forwarded to the leaders of both political parties."

The resolution was seconded by Mr. Woolcock, of London, supported by Mr. Henry J. Guerrier, of London, and carried.

The Congress soon after terminated.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday at the County Hall, Spring Gardens, Sir John Hutton, Chairman, presiding.

New Entrance to Brockwell Park.—The Parks Committee proposed to expend 5,715*l.* for the purchase of a plot of land for the purpose of forming an additional entrance to Brockwell Park, on condition that the Lambeth Vestry entered into an agreement to contribute one-third of the total cost. An amendment to refer the matter back for further consideration having been defeated, the recommendation was agreed to.

Bishop's Park, Fulham.—The same committee also recommended the Council to contribute a sum of 7,500*l.* towards the completion of the scheme for the formation of Bishop's Park, Fulham, such cost being three-fourths of the estimated cost of acquiring and adding to the Bishop's-meadow the adjoining properties known as Pryor's Bank and Thames Bank, and of laying out the same, continuing the river-wall along the front, and forming an access from Putney Bridge, the vestry undertaking to the satisfaction of the the Solicitor to maintain the ground as an open space in perpetuity. This recommendation was also agreed to.

Clerkenwell Fire Station and the Works Committee.—The Fire Brigade Committee recommended that the work of enlarging and altering the Clerkenwell fire station at an estimated cost of 6,750*l.* be executed by the Council without the intervention of a contractor, and that the plans, specification, and estimate be referred to the Works Committee for that purpose.

Alderman Beachcroft pointed out that the Architect's original estimate was only 5,500*l.* In view of that fact he thought they should seriously consider whether tenders should not be invited for the work, and he therefore moved that the report be referred back with that object. He was not opposed to the Works Department, but he saw no reason why contracts should not be invited, and why the Works Department should not tender in the ordinary way.

Mr. Ward, Chairman of the Works Committee, pointed out that the Committee would be placed at a great disadvantage if the Council placed them in the position of contractors. The ordinary contractor, if he failed to get a tender in one place, could go to another, but not so the Works Committee, and what, he asked, were they to do with all their men and machinery when, by reason of not being the lowest tenderer, they had no work to do.

Mr. J. Burns, M.P., strongly supported the Committee, and in the end their report was carried.

Cost of Work.—The Works Committee submitted a detailed return of the cost of the first thirty-two works carried out by the Committee without the intervention of a contractor. The total estimated cost of the whole of these works was 66,061*l.*, and the actual cost was less than that amount by over 3,000*l.*

Mr. Westacott criticised the report, and moved an amendment that it be received with the exception of the paragraph giving the figures of estimated and actual cost. He said where the Committee did work underground they were able to save money on the estimate, but where the work was above ground the reverse was the case.

Alderman Hoare thought it was too early to say whether this new departure was a success or not, and expressed the hope that powers would be given to the Committee to tender for the work of the Vestries and other local bodies in London.

The debate was postponed.

Deficient Water Supply.—The first paragraph of the Public Control Committee was as follows, the recommendation being agreed to—

"On July 3 last we reported to the Council as to petitions and complaints received on the subject of the inadequacy of the supply in the East London Water Company's district, and the question of obtaining legislation to raise the limit to which the company is required to give a supply to a greater height than 40 ft. was referred to the Water and Parliamentary Committees. Since the date of that report we have received numerous complaints from local sanitary authorities and others that the company has been cutting off the supply in its district nightly and, in some parts of the district, at intervals during the day, thereby causing great inconvenience to the consumers and danger to their health, as well as seriously increasing the risk to life and property in the event of fire. We addressed a letter to the company with reference to these complaints, asking for an explanation of the failure to provide and keep a constant supply as required by Section 7 of the Metropolis Water Act, 1871, and intimating that if the explanation was not satisfactory it would be the duty of the Council to consider as to taking proceedings for the enforcement of the penalties provided for by Section 16 of the Act. In reply to this letter the company sent a print of a circular which had been sent to each of the local authorities in the company's district attributing the temporary cessation of the constant service to the storage in the reservoirs having fallen far below the usual quantity, owing to deficient rainfall and the consequent non-repletion of the springs which had suffered from the drought of last year. The company also quoted an extract from the recently-issued report of General Scott, the Water Examiner to the Local Government Board, to the effect that the diminution of the flow of the River Lea had rendered it prudent to husband the company's visible supply of water. There was a complaint against the same company in 1891 of failure to maintain a constant supply in its district, and the contention of the company then was that the failure was due to frost. As the action of the East London Waterworks Company in laying on a constant supply had been voluntary, counsel was asked to advise whether in such a case a company was liable to a penalty for not continuing the supply. Counsel advised that Section 7 of the Metropolis Water Act, 1871, imposed upon a company which had voluntarily proposed to give a constant supply, and commenced to give it, the obligation to continue to give it, and that Section 16 applied equally to a company which had voluntarily undertaken to give a constant supply as to a company which had been required to do so. The Council thereupon addressed a letter to the East London Water Company in July, 1891, stating that in the event of any future failure to maintain a constant supply in that portion of the company's district within the county of London, it would be incumbent on the Council to take proceedings. Having regard to this warning, o the repeated complaints which have since been received, to the fact that drought now pleaded as the company's excuse was urged in its defence last year when proceedings were taken against it by the Industrial Dwellings Company, and to the serious danger to the health of the community which must result from a deficient supply of water in a crowded district, we are of

opinion that the time has arrived when the Council should take action for the enforcement of penalties. We recommend—

'That the Solicitor be instructed to take proceedings against the East London Waterworks Company for failure to maintain in its district a constant supply as required by the provisions of the Metropolis Water Act, 1871.'"

Surveying Sources of Water Supply.—The Water Committee brought up the following report:—

"In view of the inquiries which we are now making as to available sources of water supply for London, it is essential that we should have reliable information respecting certain large reservoirs in connexion with a scheme now being considered. This information can only be obtained by having proper surveys of the reservoirs made, and the chief engineer estimates that the cost of so doing will be about 450*l.*, which includes 200*l.* for one year's salary of the person to be employed, and 250*l.* for necessary expenses. We have satisfied ourselves that this is a reasonable amount, and we have decided to advise the Council to sanction the expenditure. We recommend—

'That, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, authority be given to us to have surveys made of certain large reservoirs, the cost of such surveys not to exceed 450*l.*'"

Mr. Antrobus asked if the inquiry was in reference to a direct supply from Wales.

Mr. Bassett Hopkins said that it would not be in the public interest that he should add anything to the recommendation.

Mr. J. Howell Williams asked whether the Committee had considered the possibility of co-operating with Birmingham in securing a water supply for London.

Mr. Bassett Hopkins said that point had certainly not escaped the attention of the Committee.

The recommendation was agreed to.

London Building Act, 1894.—The report of the Building Act Committee contained the following paragraph, the recommendation being agreed to:—

"We are of opinion that it would be of advantage to the Council and the public if the London Building Act, 1894, together with the regulations of the Council as to applications for sanction or consent under the Act, and the by-laws now in force, were to be printed and issued in book-form. This, for which we anticipate there would be a great demand on the part of the public, would form a complete code with reference to the control of building operations in London. We are advised that the cost of 1,000 copies would not exceed 75*l.*, and we think they could be placed on sale at the price of 2s. 6d. each. We accordingly recommended—

'That, subject to an estimate being submitted by the Finance Committee as required by the statute, the London Building Act, 1894, with the Council's regulations as to applications for sanction or consent under the Act, and the by-laws now in force relative to buildings, be printed at a cost not exceeding 75*l.* for 1,000 copies, and be placed on sale at the price of half-a-crown each copy.'

We have given instructions for an advertisement to be issued calling attention to the fact that the London Building Act will come into force on the 1st January next; and should the Council adopt the above recommendation, an intimation will be given in the advertisement that copies of the Act, with the by-laws and regulations, will be obtainable of Mr. E. Stanford."

Tower Bridge Southern Approach.—The Parliamentary and Improvements Committee jointly reported on the subject of the Tower Bridge (Southern Approach) Bill. They recommended: "(1) That the line of route previously decided upon by the Council for the southern approach to the Tower Bridge be adhered to. (2) That the Bill be re-introduced in the next Session in the form in which it was passed by the House of Commons and sent up to the House of Lords in June, 1894."

Mr. Howell Williams moved that the recommendation be referred back to allow of a fuller inquiry into alternative routes.

Mr. Payne seconded the amendment.

Mr. Arter said the Improvements Committee had regarded the Tower Bridge as the London Bridge of the future, and had arranged the route accordingly.

On a division, and by 48 votes to 36, the debate was adjourned.

The Council adjourned soon after 7 o'clock.

ASHER'S PATENT CHIMNEY-TOP.—There is no difference between the principle of this and many other up-draught cowls; there is a variation in detail in the fact that the induced current is led up a spiral passage around the chimney-top or pipe. What result the patentees can expect from this, except to increase friction and thereby weaken the current of air, we cannot see. Some of our readers, however, may like to experiment with it.

Correspondence.

To the Editor of THE BUILDER.

SCREENING OF HEATED FLUES.

SIR,—"Fireproof," in your penultimate issue, asks for suggestions for preventing excess of heat of a flue, from penetrating the half-brickwork with which its inner side is enclosed. But he does not give particulars sufficient to ensure a ready reply. How high is the flue and what is the size of the fire or furnace? Is the fire close or open?

Slabs of combined slag-wool and plaster, the slag-wool held together on the unplastered side by wire-netting, might be applied. The slag-wool side of these non-conducting slabs to be placed next the brickwork, and the outside, plaster sides, of the slabs afterwards jointed and set with plaster.

I got over a similar difficulty in a public institution, where the flue, 14 in. by 9 in., and 70 ft. high (passing through several wood floors) was from the close furnace of a small cylindrical bath boiler. The flue was on all sides formed of 9-in. brickwork, and carried up in one stack together with the ordinary flues of the open fireplaces of the rooms, one side being flush with the inner faces of the room-walls, and plastered over in the same plane. The heat which came through was quite alarming. To have applied the slag-wool remedy, suggested above, would have involved retrimming all the floors and ceilings, and would have resulted also in an unsightly projection and the alteration of a flight of stairs, to say nothing of the inconvenience and expense. Consequently another and simpler remedy was devised. A 9 in. by 9 in. air-inlet grating was inserted in the basement portion of the flue above the damper, and about 2 ft. below the ceiling, which was a fireproof one. This cooled the air and gases in the flue without injuriously affecting its draught, and had the further beneficial effect of preventing the attendants misusing the furnace by improperly forcing the fire by means of the abuse of the damper.

The cure is quite effectual and satisfactory, but if it be applied to a chimney which is too short, such a method might unduly check the draught. At any rate, the experiment could be carried out at a trifling cost, and the size of the inlet modified to such size as would give the best result. I imagine "Fireproof's" chimney is not so very short, or the heat would not trouble him. A. HARSTON.

ACTION OF WATER ON GALVANISED IRON.

SIR,—I desire to draw the attention of your readers to the following, and should be glad to get the advice of any who may have had similar experience.

About two years ago I fixed a system of hot and cold water to a bath, the supply-cistern and hot-water tank being of stout galvanised iron. The water is heavily charged with hardening matter, and has eaten the tanks in several places, allowing the water to percolate through, more especially in the hot-water tank. The information I seek is—1. What is the destructive agent? 2. What is my e medy? G. H.

*** Without a chemical analysis of the water concerned it would not be easy to answer the question to any purpose. Our correspondent writes from Ledbury; possibly some reader may know something of the character of the water supply in that neighbourhood.—ED.

WATER LODGING ON MEETING-RAILS.

SIR,—Replying to "T.'s" letter in last week's *Builder re* above, we would beg to point out that in May, 1893, we patented a condensation sill for the prevention of the collection of condensation water (sketch enclosed). WILLIAMS BROS & CO.

*** The sketch section of Messrs. Williams' sash-rail seems calculated to answer the purpose much better than the suggestion made by "T."—ED.

A TURKISH SCHOOL OF ARCHITECTURE.—We learn that a professor of mathematics at the Mulkié School at Stamboul has asked the Turkish Imperial Government to authorise the establishment of a school of architecture.

The Student's Column.

DETAILS OF RURAL WATER SUPPLY.—XVIII.

PIPES (*continued*).

THE pipes, after being cleaned, are struck all round with a light hammer, and, if sound, are placed in the testing machine (fig. 48) and tested by oil or water; the former is perhaps better for the iron-work, but is more costly, and the benefit derived therefrom small. Gaskets or steel rings wrapped with yarn are hung at each end of the pipe, to form a joint with the iron plates, one of which (*a*) is fixed, and the other (*b*) movable, the latter being driven forward by a screw and gearing worked by hand. The screw-plate has an air-pipe (*c*) cast in it, through which the air escapes, as the water, flowing in, fills the pipe under test. When the water flows full-bore through the air-pipe, showing that the air has escaped, the valve is closed and the screw-plate tightened up, the pump having been started just before. The pressure-gauge, which should be placed in a conspicuous position, records the rise of pressure. Attention must be given during the whole of the testing operation to the behaviour of the pipe. When the testing limit is reached, a valve between the pump and the testing-machine is closed, shutting off the connexion with the pump and allowing the pipe to remain under the specified pressure while it is examined and struck with a hammer. During this period the gauge should remain stationary, unless there is a loss from leakage, which must at once be stopped and the test restarted. After being tested for pressure, the pipe is tested for thickness and uniformity of metal by means of calipers and a disc (fig. 49).

Fig 48

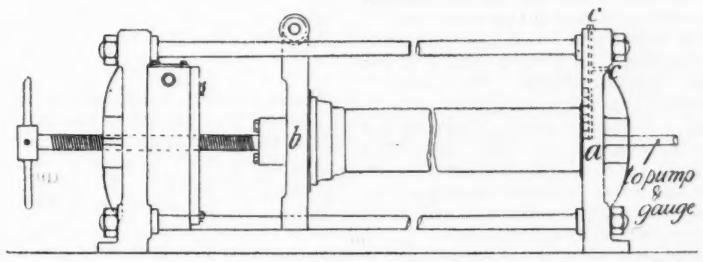
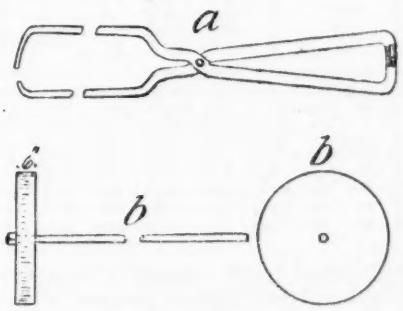


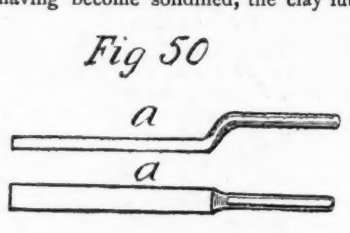
Fig 49



The examination being satisfactory, the pipe is conveyed to a heating-stove and raised to a temperature of 400 deg. Fahr., previous to dipping it in what is termed Dr. Angus Smith's composition, consisting of pitch, asphalt, resin, and linseed oil at a temperature of 300 deg. Fahr. The pipe is then ready for delivery on the site of the works. The pipes are lowered into the trench prepared for them, either by hand by means of ropes, or by a block-and-tackle arrangement attached to tripod legs. The trench is sufficiently enlarged at the junctions of the pipes so as to admit of the jointing material being properly filled, caulked, and examined. Each pipe is struck with a hammer for soundness, and the spigot end carefully driven up into the socket of the preceding pipe, after which it is ranged in line and set at the required level, attention being paid to the even thickness of the joint. The lead joint is made by driving a gasket of strip lead or a few coils of yarn into the space between the spigot and the socket by means of a yarning-iron (fig. 50*a*). The former method is coming into general use, and is preferable on sanitary grounds, as the yarn becomes a nest for bacteria. The gasket having been slightly driven up to the back of the socket, the joint is ready for the clay luting, which is placed around the lead space at the face of the socket, with a lip at the top to

receive the molten lead. Care must be taken to remove the dross before running the molten lead, which must in all cases be done in one operation, so as to ensure a solid joint throughout. The lead having become solidified, the clay luting is

Fig 50



removed, the surplus lead at the lip cut off, and the joint set up at least ⅛ in. within the socket by means of caulking-tools (fig. 50 *b*). After each joint is completed the pipe should be examined inside to see if any lead has run through from careless yarning, so that it may be removed.

The joints of turned and bored pipes are made by painting the machined portion with thin red lead or liquid Portland cement. The spigot is then placed within the socket and driven up with a wooden maul. The labour entailed in laying this class of pipes is small, and the general experience where they have been adopted is that they are quite equal to lead joints except for turning curves, where the lead joint may be utilised as well as for expansion purposes already referred to.

Wrought-iron or steel pipes are largely used in the smaller sizes for connecting services in the place of lead pipes where the water is of such a nature as to attack the lead and produce lead-poisoning. The pipes consist of strips of metal either welded or solid drawn, with screwed socket-joints; they are usually galvanised, and can be manufactured to suit any pressure required. Wrought-iron tubes are made in lengths usually not exceeding 14 ft., but can be obtained up to 20 ft. in length if necessary. They are made in three qualities—gas, water, and steam—the steam-tubes being two gauges, and the water-tubes one gauge thicker than the gas-tubes.

The following table gives the results of Messrs. J. Russel's experiments with wrought-iron solid drawn tubes, according to Mr. D. K. Clarke:—

External Diameter.	Thickness.		Internal Diameter.	Bursting Pressure.		Collapsing Pressure.		Difference between Bursting and Collapsing Pressure.
				Per sq. in. of Surface.	Per sq. in. of Section of Metal.	Per sq. in. of Surface.	Per sq. in. of Section of Metal.	
in.	b.w.g.	in.	in.	lbs.	tons.	lbs.	tons.	tons.
3½	10	·134	2·982	4800	23·84	3300	17·86	5·98
3½	10	·134	2·857	4500	21·42	3150	16·40	5·02
3	11	·120	2·760	4500	23·10	3500	19·53	3·57
2½	11	·120	2·510	5200	24·28	3500	17·89	6·39
2½	11	·120	2·260	5000	21·02	3600	16·74	4·28
2¼	11	·120	2·010	5900	22·06	4500	18·82	3·24
2	12	·109	1·782	5900	21·53	4900	20·07	1·46
1¾	12	·109	1·532	5600	17·57	4000	14·33	3·24

The greater tensile strength of wrought-iron and steel, and their lightness compared with cast-iron, give them great advantages over the last metal in such cases where weight and strength are the main objects, although for cheapness and convenience in casting, as well as the greater thickness for corrosion, it is doubtful whether wrought-iron or steel will replace cast-iron in the manufacture of pipes. The action of the Bradford Corporation in adopting them in their new works may lead to their more general use for large mains, in somewhat inaccessible districts where the question of weight is a serious one.

Lead pipes are of almost universal application for service connexions and interior fittiugs on account of the facility with which they can be bent to suit the irregularities of structure, and it is a matter of importance that they should be of good quality and of sufficient strength for the purpose. The following table gives the sizes of pipes usually specified for service connexions:—

½ in. diameter 6 lbs. per yard.
¾ „ 9 „ „
1 „ 12 „ „
1¼ „ 16 „ „

Any of these pipes would stand a pressure of 500 ft. head of water. Several methods have been proposed for preventing the solvent action of some waters upon the lead, one of which is to line the interior of the pipe with block tin; but none of the many proposals have been largely adopted.

Clay pipes are frequently used for conveying water in collecting-drains and other situations where there is no head of pressure on the pipes. The joints are either left dry or filled with Portland cement as the circumstances require.

The following table of the dimensions of clay pipes was adopted by Mr. Baldwin Latham for the Bideford Waterworks:—

Internal Diameter.	Stoneware.		Fireclay.		Other Clays. Thickness.	All pipes. Depth of Socket.
	Thickness.	Length in work.	Thickness.	Length in work.		
In.	In.	Ft.	In.	Ft.	In.	In.
2	—	—	—	—	5/16	—
3	⅜	2	⅜	2	⅜	1⅛
4	⅜	2	⅜	2	⅜	1⅛
6	⅜	2	⅜	2	⅜	1¼
9	½	2	½	2	½	2
10	½	2	1	2	—	—
12	1⅛	2	1 1/10	2	1	2
15	1⅛	2	1¼	2 to 3	1¼	2¼
18	1¼	2 to 3	1½	2 to 3	2½	2½

When extensive works are being carried out it is customary to appoint an inspector to be present during the entire operations of casting and testing at the foundry. This entails a considerable expense which cannot be borne by a small undertaking. As the pipes are liable to suffer from shocks and concussions from rough handling and other causes in transit from the foundry to the site of operations, as well as from injuries in the course of jointing and lowering into the trenches, such inspection alone is not always satisfactory. In support of this view the experience recorded in connexion with the waterworks construction at Market Harborough by Mr. H. G. Coates, A.M.Inst.C.E., may be instanced. The pipes were cast and tested at the foundry under the supervision of an inspector, the tests being conducted in accordance with the following schedule:—

Diameter of pipe.	Thickness of pipe.	Proof pressure equal to a column of water.	Or lbs. per sq. in.	Maximum pressure in feet to which pipe will be subjected in work.
in.	in.	ft.		
10	½	450	195	205
8	7/16	450	195	205
7	7/16	300	130	20
6	7/16	400	195	205
4	5/16	500	217	215
2	5/16	500	217	210

The pipes being struck with a hammer in all their parts whilst under pressure. Test-bars of the metal actually used were also carefully proved.

The whole of the system, comprising 8¼ miles of 10-in., 65 yds. of 8-in., 2 miles, 1,410 yds. of 6-in., 5 miles, 850 yds. of 4-in., and 1,380 yds. of 2-in. pipes were subsequently tested in sections in the trenches by hydrostatic pressure to 50 lbs. per square inch above the working pressure. The following is a list of the rejected pipes resulting from this second test:—

460 10-in. pipes. 97 4-in. pipes.
89 6-in. „ 10 2-in. „

weighing about 141½ tons, or over 8 per cent. of the weight delivered.

To enable the process of testing in the trenches to be conducted economically, the pipes should be laid from the reservoir towards the site of distribution, so that the water may follow the work, and the cost saved of filling the sections to be tested by water-carts.

The method of testing is as follows:—The terminal pipe is closed by means of a blank socket, drilled and tapped to receive the connecting pipe from the pressure-pump. The connecting pipe may consist either of a short length of strong hose—which is undoubtedly the most convenient—or of wrought-iron tube with proper bends. In either case the connexion with the pump should be made by means of a screw-union, so that the machine can be easily disconnected. The pump usually consists of a small Tangye pump, similar to that used for testing boilers, mounted over a tank or reservoir, which is frequently placed upon wheels. A water pressure-gauge, showing the pressure in feet of water and in lbs. per square inch, is attached where it can be easily seen; also a safety-valve, and valve for lowering the pressure.

The section of pipe to be tested is then slowly charged with water by opening the sluice-valves between it and the reservoir, the air in the pipes being got rid of by means of the air-valves and ball-hydrants (if any) on the section. It is well to open the valve for lowering the pressure, above referred to, and to allow the escaping water to carry the air with it. The importance of getting rid of as much air as possible is great, both on account of the time and labour saved in getting up the pressure, as well as the danger from flying pieces of pipe, &c., were a burst to take place. In a small waterworks now being carried out the two following tests were made:—

1.—Length of section, 420 yards; diameter of pipes, 3 in.; pressure attained, 230 lbs. per square inch. Time, ten hours.

2.—Length of section, 250 yards; diameter of pipes, 2 in.; pressure attained, 230 lbs. per square inch. Time, three minutes.

In the former case the line of pipes was undulating and the air lodged in the high points. In the latter case the pipes were laid at a uniform slope. Having dislodged as much air as possible, the valve for lowering the pressure and the nearest sluice-valve should be tightly closed and pumping commenced. The pump-tank is kept constantly filled by means of a water-cart or by buckets, the quantity of water required depending upon the amount of air in the pipes and the number and extent of leakages.

The line of pipes should be carefully examined while the pressure is rising, and pegs driven or marks made at any sign of failure. When the pressure has risen, as shown by the gauge, to the proof point, which should be at least double the working head, it should be kept there while the pipes are submitted to a close scrutiny. It must be noted if the needle remains steady when pumping ceases, or falls more or less rapidly. The behaviour of the needle under these circumstances greatly depends upon whether the instrument is situated at the highest or lowest level of the section under test. In the former case a slight leak will cause the needle to fall rapidly; in the latter the needle will be scarcely affected.

No part of the trench must of course have been filled in until the testing has been satisfactorily completed, and any water in the trenches must, if possible, be removed, otherwise the examination is bound to be imperfect.

The most familiar failures are split or cracked pipes, honeycombed-sockets, pin-holes, blown core-nails, and leaking joints. Each point of failure must be carefully recorded by means of a peg or intelligible mark. The pressure is then lowered, defects made good, and the section re-tested.

Pin-holes in otherwise sound pipes may be drilled, tapped, and plugged with brass or gun-metal plugs, but only with the special permission of the engineer in each case. Weeping joints may frequently be remedied by the application of the caulking-tool. Honeycombed or perforated sockets, or split pipes, must be cut out, and the line of pipe made good by means of a short piece cut to the requisite length, and a thimble or sleeve.

Corrosion or rusting of iron pipes, both externally (and internally, is an element not to be lost sight of by the engineer. Externally it is caused either by the oxygen in the water attacking them where the pipes are laid in damp ground, or by the presence of corrosive substances in the soil, which occasionally occurs in the neighbourhood of chemical works, &c. The former, in the case of cast-iron pipes, may be neglected if they are properly protected by coating with Dr. Angus Smith's solution, on account of the comparatively great thickness of the shell; the latter must be prevented where necessary by embedding the pipes in concrete. Internally, corrosion is caused by the oxygen in the water attacking the metal, and is usually more serious with soft than with hard water. The coating of the interior of the pipes with the protecting solution must be carefully attended to, and made a special point in their inspection. Even with the most careful coating corrosion is almost certain to occur, but the process will greatly delay it; minute points are left unprotected, and corrosion will take place, gradually scaling off the intervening varnish where these points are close together. The danger of weakening the pipes is small, for the reason above stated, but the real trouble lies in the contraction of the bore of the pipes caused by the nodules of rust (the rust does not form in even layers), which diminishes their discharging capacity and reduces the working head. Mr. Thomas Box ("Practical Hydraulics") records a case at Torquay where a main about 14 miles long, composed of 14,267 yds. of 10-in., 10,085 yds.

of 9-in., and 170 yds. of 8-in. pipe delivered only 317 gallons per minute, with 465 ft. head, or only 50 per cent. of the theoretical discharge. The pipes were subjected to repeated scrapings by means of scrapers worked through their entire length, the result of which was that the experimental discharge was brought up to the theoretical.

On account of corrosion, wrought-iron tubes for conveying water should always be galvanised. In designing systems of pipes it is always advisable to increase the calculated diameter so as to allow for corrosion.

The following memoranda will be useful to the student when calculating the weight of pipes :—

Wrought-iron...	1 cubic inch	0·278	lb.
,,	1 cubic foot	480	,,
Cast-iron.....	1 cubic inch	0·260	,,
,, ...	1 cubic foot	450	,,
Steel	1 cubic inch	0·283	,,
,, ...	1 cubic foot	489·6	,,
Lead	1 cubic inch	0·412	,,
,, ...	1 cubic foot	712	,,
Gun-metal	1 cubic inch	0·304	,,
,, ...	1 cubic foot	524	,,

OBITUARY.

Mr. J. B. M'Callum.—Mr. J. B. M'Callum, Borough Engineer of Blackburn, died on the 30th ult. Three weeks ago he fell in the street, breaking his leg and dislocating his ankle, and blood poisoning and erysipelas subsequently set in. Mr. M'Callum was formerly Borough Engineer at Stafford, and has held his Blackburn post for 12 years.

GENERAL BUILDING NEWS.

Museum at Norwich Castle.—On the 25th ult. the keep of Norwich Castle and the surrounding buildings were opened by the Duke and Duchess of York as the Museum of the City of Norwich. The blocks of prison cells erected in the early years of this century have been gutted and converted into pavilions lit by glass roofs, the former corridors being utilized as connecting-links by means of which visitors will pass round the buildings in a circle. They all look inwards on the centre space, formerly occupied by the house of the prison Governor, and now laid down with grass and gravel. The keep has been treated with great care, the removal of the buildings which had grown up within it having brought to light a great deal of Norman detail, which has been left as far as possible untouched. It has been intended that any repair absolutely necessary should tell its own tale. A double-ridged glazed roof has been placed on the lines of the former roof, which were clearly marked on the external walls. A substantial gallery has been carried round the interior at the level of the former principal floor, from which access is obtained to the fine old Norman doorway, and to the circular staircases in the north-east and south-west corners, which lead to the original wall-passages and to the parapet behind the battlements. From this parapet a fine view of the city is obtained. The architect for the work was Mr. E. Boardman, and the contractor Mr. G. E. Hawes.

Church, Buckfastleigh, Devonshire.—The Bishop of Exeter dedicated the new church of St. Luke, Buckfastleigh, on the 12th ult. It is built of local limestone. The facings are of Hamhill stone, the windows are lancet-head shaped. The main entrance is at the west end of the north side, and is protected by a porch of red deal, the interior fittings being of the same material. At the opposite end of the same side is the entrance to the vestry. Underneath is made provision for a heating apparatus. On the opposite side has been left space, which, it is hoped, in time will be utilised as an organ-chamber. The dimensions of the church, which can accommodate 350 people, are 60 ft. in length, 40 ft. in width, and about 40 ft. in height. The space from floor to eaves is 23 ft. The chancel is 25 ft. by 20 ft. The new building was erected by Mr. Henry Stevens, of Ashburton, Mr. C. G. S. Acock, of Totnes, being the architect.

Renovation of Parish Church, Starcross, Devonshire.—The Parish Church of St. Paul, Starcross, was re-opened on the 20th ult., after having been closed for the purposes of the renovation of the interior, re-seating, &c. The former high pews have been removed and new open benches of stained and varnished pitch-pine substituted, the aisles being laid with wood-block paving. At the western doorway an entrance lobby has been formed with pitch-pine framing, and swing doors, the upper portions being filled with tinted cathedral lead glazing. The roof timbers have been painted and varnished, and the plaster ceiling between them tinted and divided into panels with stencilled border. The organ and choir seats formerly occupied the western gallery, but pitch-pine stalls are now provided for the clergy and choir westward of the chancel arch, the space occupied by the stalls being raised above the level of the nave floor, and laid with encaustic tiles. The organ has been rebuilt and considerably enlarged by Messrs. Hele & Co., and now stands in the south-east corner of the nave in close proximity to the choir. A carved oak pulpit and lectern have been presented by members of the congregation, and are in course of preparation by Messrs. Hems & Sons. The whole of the works have been carried out from the designs and under the superintendence of Messrs. J. W. Rowell & Son, architects, of Newton Abbot.

Building Trade in Edinburgh.—The annual meeting of the Incorporation of Edinburgh Guildry was held on the 22nd ult. The Dean of Guild said during the past year there had been a considerable increase in the number of warrants granted for the erection of dwelling-houses, especially tenements. The number of first-class houses and villas authorised was seventy-two, and the number of tenement houses 753. Of the latter, 224 were houses of two rooms, 280 of three rooms, and the remainder had four rooms and upwards. At the same time it was to be regretted that no new housing was being provided for the poor and labouring classes. The promotion of the City Improvement scheme had brought this question to the front, and he hoped something practical might be accomplished during the coming year. The extension of the city was chiefly westwards and north-westwards, and was in some instances going beyond the municipal boundaries. This raised the question whether in the unification and adjustment of parish boundaries the city boundaries ought not to be extended so as to include, or nearly include, St. Cuthbert's parish.

Restoration of Milburn Parish Church, Cumberland. — The Church of St. Cuthbert, Milburn, which during the past few months has been closed for structural alterations and restoration, was re-opened by the Bishop of the diocese on the 19th ult. The church is Gothic in style, and was in a very dilapidated condition. The contractors for the respective works were :—Joinery, Mr. J. Moor, Penrith; masonry, Mr. Hindson, Penrith; plumber, &c., Mr. J. Jackson, Penrith; and Messrs. Watson, were the architects.

Crundale Church, Kent.—The parish church of Crundale, near Wye, Kent, has been re-opened by the Bishop of Dover, after having been thoroughly repaired. The building consists of a wide nave with a north aisle and porch, chancel, with a low, square tower on its northern side. The foundation of the church is of remote antiquity, and there are some indications which lead to the belief that the hill on which it stands was fortified at some early period. The bulk of the walls are of Early Norman date, although the tower is of the thirteenth century, and the chancel from the middle of the fourteenth. A few windows are insertions of the fifteenth century, and the reredos and chancel rails, of oak, date from the commencement of the last century. Until recently the north aisle was partitioned off from the nave, and its western part, without a floor, was used as a store for coals. The pews were square, uncomfortable boxes, in wretched condition, while the plastered walls and ceilings were badly dilapidated. The roofs have been stripped, boarded, lined with felt, and the old tiles replaced without disturbing the lichens and moss growing upon them; the windows have been reglazed, the flooring renewed on a layer of concrete to exclude damp, and open benches of convenient form have been substituted for the old pews. The north porch, which was of thin, modern brickwork, has been cased with flint and stone, and the east end, also of red brick, has been transformed into a church-like design, with a new traceried window and buttresses. The ivy has been allowed to grow over the tower, where it does service to cover various patchings of brickwork of the last century in date. There is a curious ancient leaded spirelet above the tower which has been repaired. Many antiquarian discoveries were made during the progress of the repairs, among which the following may be noted. The old rood-loft staircase was found almost perfect, having only been loosely filled in at each end. There is no chancel-arch, but the division between nave and chancel was effected by a beam which proved to be that of the old rood-loft. It had been covered at a later date with texts, a few traces of which were visible below later casing. It has been strengthened and repaired, and the arms of Queen Anne which were above it have been preserved, but removed to the west end. A sedile, of fourteenth-century work, portions of which only were visible before the repairs, has been opened out to view, and a piscina has been found beyond it. Above the piscina a small lancet window at the extreme south-west end of the chancel has been met with and restored. The foundations of the old Norman chancel were revealed when the earth was cleared away from the walls, of greater thickness than the later chancel walls built upon them. A wide arch on the south side, built up, indicates that at some period before the existence of the fourteenth-century chancel, a transept-like building must have opened out from it, removed, however, at an early period. Part of the foundations of this curious structure were met with, but they could not be traced far, owing to the existence of graves. An interesting window on the north side of the chancel has been restored. It had lost its tracery, but the form was indicated by the shape of the label. Some artistic pieces of stained glass have been carefully preserved. Portions of the rood-screen were found beneath the flooring, and a single traceried head has been worked into a new lectern made by Messrs. Jones & Willis. The church has been well known on account of its containing the fine incised alabaster slab to the memory of John Spratt, rector. It was doing duty as a paving stone in the chancel, but being much injured by traffic, it was determined to raise it for preservation. It proves to have been the covering slab of an altar tomb, for its edge is moulded. It has been laid on a base formed of old fragments met with in the north aisle. The old oak reredos has been cleaned, and also the communion-rails. The works have been carried out by Mr. Wilson, builder, of Canterbury, under the superintendence of the architect, Mr. E. P. Loftus Brock, F.S.A., of London. The cost, including heating apparatus, lightning-conductor, and the recasting of one of the bells, has been under 1,400*l*. No attempt has been made to interfere with the ancient appearance of the fabric, and the old masonry has neither been cleaned nor scraped.

Corn Exchange, Oxford.—On the 22nd ult. the Mayor of Oxford, Alderman Gray, laid the foundation-stone of the new Corn Exchange in George-street. Besides making provision for a Corn Exchange, the design for the building includes premises for the accommodation of the Volunteer Fire Brigade, as well as a range of shops fronting George-street. The Corn Exchange, 71 ft. long by 53 ft. wide, abuts on the Gloucester Green side of the site, but the main entrance is arranged from George-street. The entrance leads up a flight of steps into a vestibule, and thence into the Exchange. Other entrances are also provided from the Gloucester Green side. A gallery is carried all along the east side of the Exchange, with staircases at either end of it and a recess in the centre forming a band-stand. Lavatory accommodation, offices, heating-vaults, and store cellars are duly provided. The Fire Brigade station is placed in the east side of the site, adjoining St. George's Church, and running the full depth from George-street to Gloucester Green. The accommodation includes an engine-house, drill-shed, watch-room, messenger's-room, and workshops; also a hose-tower, about 60 ft. high. On the upper floor are arranged the club-rooms, committee-rooms, and stores. A dwelling-house is also provided for the resident fireman. The remaining portion of the George-street frontage is taken up by a range of four shops, with residences over. The buildings are being executed in red brick with freestone dressings. The architect for the work is Mr. H. W. Moore, and the contractor Mr. Thomas Axtell, both of Oxford.

Church, Landport, Hampshire.—On the 27th ult. the foundation-stone was laid of the new Church of St. Agatha, in Conway-street, Landport. Messrs. Light & Son are the builders, and the work is being carried out under the superintendence of the architect, Mr. J. Henry Ball, of Southsea. The portion of the church at present in course of erection includes the nave, south aisle, and side chapel. The foundation-stone was of white marble, and shows the arms of Winchester College below the words—"To the greater Glory of God." It was carved by Mr. Hoare, of Southsea, from designs by the architect. The church is designed in the Romanesque style. The nave and side aisle will be finished with semicircular domed apses. The columns of the main arcade are of red polished granite, with Portland stone capitals and bases. Those on the right side of the entrance are already in position. The side chapel will form a complete church, accommodating about 250 persons. The total length of the edifice will be 124 ft., with a width of 69 ft. 6 in., the nave having a span of 40 ft. Upwards of 800 people will find seats in it.

Building in Bradford in 1894.—The number of building plans deposited with the Bradford Corporation during the municipal year just ended was 494, of which 288 were approved.

Tower, St. Michael and All Angels' Church, Heydour, Sleaford.—The Dean of Lincoln re-dedicated the tower of St. Michael and All Angels' Church at Heydour, near Sleaford, on the 23rd ult., after restoration at a cost of 500*l*. The work was rendered necessary in consequence of the failure of the foundations, which entailed six months' labour to make the tower safe and restore it to its original condition. Mr. W. White, of London, was the architect.

Proposed Infectious Hospital, East Grinstead.—A Local Government Board inquiry was held last week at East Grinstead by Dr. Sweeting, one of the Inspectors to the Board, concerning an application by the Local Board of East Grinstead to borrow 3,500*l*. for the purchase of four acres of land and building an isolation hospital on it. The Board's Surveyor, Mr. W. W. Gale, said the land was four acres in extent, and ranged from 400 ft. to 450 ft. above the sea-level. There were five houses within a quarter-mile radius, and fourteen houses, all private, within a half-mile radius. It was 1¼ miles from the parish church, which was in the centre of the town. There was a good hard road the whole way to it. The soil was about 9 in. of loam, then 5 ft. or 6 ft. of clay overlying sand-rock. The hospital would be supplied with water by the East Grinstead Gas and Water Company. A railway cutting, 40 ft. deep, immediately adjoined the site, which was thereby naturally drained, and would not need under-draining. The prevailing winds were south-westerly. The site was bounded on the north and west by fields belonging to the vendor, on the south-west by a public road, and on the east by the railway-cutting. The hospital generally would consist of five separate

blocks—two wards, an administrative block, a wash-house block, and a mortuary block. Mr. Gale then proceeded to describe the plans to the Inspector, and stated that his estimate of the cost of carrying them out was 2,916*l.* The Inspector was asked to let the Board know the result of the enquiry before the end of the present month if possible, as the vendor had already twice extended the time for the completion of the purchase. The Inspector said it was quite hopeless that the Local Government Board could give its decision by the date named, but the matter should be urged on with all possible expedition.

SANITARY AND ENGINEERING NEWS.

SEWERAGE OF RUNTON, NORFOLK.—Application having been made to the Local Government Board for sanction to borrow 1,000*l.* for works of sewerage for the parish of Runton, an inquiry was held by Mr. Thomas Codrington, M.Inst.C.E., at the Runton reading-room, on the 24th ult. Mr. R. M. Parkinson, A.M.Inst.C.E., described the plans.

SEWERAGE WORKS, OVERSTRAND, NORFOLK.—Mr. Thomas Codrington, M.Inst.C.E., Local Government Board Inspector, held an inquiry at the Suffield Park Hotel, on the 23rd ult., in consequence of an application having been made to the Board for sanction to borrow the sum of 2,000*l.* for works of sewerage in connexion with the Suffield Park district. Mr. Parkinson described the plans, and said it was proposed to take the sewer through the lighthouse hills, and to have an outfall on to the beach to extend to low-water or ordinary spring-tides. This outfall would be fixed at a spot about seventy yards east of the boundary between Cromer and Overstrand.

THE SANITARY INSPECTORS' ASSOCIATION.—In connexion with the course of lectures and demonstrations arranged by the Sanitary Inspectors' Association for Sanitary Officers, Professor Vivian B. Lewes, F.C.S., F.I.C., delivered the third of a series of five lectures on "Combustion, and the Influence of its Products on Health," at St. James's Hall, Piccadilly, on Monday evening. Mr. Alexander, of Shoreditch, presided. The lecturer said it must have occurred to those present, while he was speaking of carbon-dioxide, that inasmuch as carbon-dioxide was being generated by a large number of different gases on the face of the earth, it must be gradually increasing in quantity. Moreover, seeing that they could only have a very minute quantity of carbon-dioxide present without there health being seriously affected, that pointed to there being something at work in nature which would reduce the quantity of this gas and revivify the atmosphere. They could not reduce the oxygen by a quarter per cent., nor increase carbon-dioxide by one-tenth per cent., without affecting health and life. How, then, did nature succeed in keeping the atmosphere in a constant condition for us to live in, while they had on the one hand oxygen being withdrawn, and, on the other hand, carbon-dioxide being put into the atmosphere? Faraday, in the middle of the present century, calculated how much oxygen was daily used and converted into dioxide. The population, in the course of respiration, used up an immense amount, and animals even more, while combustion used up as much as did the respiration of the population; finally, there were fermentation and other processes working and doing the same thing, the amount of oxygen used in a day being 3½ million tons. How was the balance kept perfect? Nature had specially arranged for this in some most beautiful ways. In the first place, carbon-dioxide was a compound built up of carbon and oxygen. He had shown them how it was built up by respiration, combustion, &c., and it was equally a fact that they couid break up carbon-dioxide once again into carbon and oxygen. Professor Lewes gave a demonstration of this process, effected by means of potassium, and he said that the fact of their being able to accomplish that was a fundamental part of the secret by which nature converted the carbon-dioxide which formed on the surface of the earth and rendered the air fit for them to live in; wherever there was vegetation growing it was undoing the pollution of the atmosphere, brought about by animal life, the oxygen which had been used up being again liberated. The moral of this was that they should crowd their living-rooms with plants. Wherever they had the sun's rays, or what they termed diffused daylight, vegetation would be doing its work. At night there was generally a slight reflex action and a slight giving-off of carbon dioxide, and this pointed to the fact that in their sleeping-rooms plants were not as good as in living-rooms, where they did most admirable work. It was the growth of big vegetation that kept the atmosphere fit for them to live in. The lecturer next dealt with the diffusion of gases, and explained how strong the action of diffusion was. These two natural laws, he said—the action of diffusion and the action of plant life—sufficed to keep the atmosphere in so constant a condition that it took fifty years for the philosophers to find out that it was a mechanical mixture and not a chemical compound. So rapidly did diffusion take place, and the gases find their way evenly throughout the atmosphere, that it was impossible in any town to detect any carbon-dioxide. As far as nitrogen, oxygen, and carbon-dioxide were concerned it was only by tests of a delicate character that differences were found to exist. Concerning local impurities, which the lecturer said existed only where there was cause for them, they were many in number, and might be divided into solids, liquids, and gases. Having referred in some detail to these impurities under the three headings mentioned, he spoke of the actions which carry on life, dealing especially with the manner in which, by the diffusion of oxygen into the blood, nature gets rid of the used-up matter in our bodies. Professor Lewes's fourth lecture will be delivered next Monday evening.

SEWAGE DISPOSAL WORKS, UCKFIELD.—At the last meeting of the Uckfield Local Board formal sanction was received from the Local Government Board to a loan of 2,000*l.* for sewage disposal works. These works comprise the lifting of the sewage by pumps worked by a gas-engine a height of 80 ft., and the disposal of the sewage by broad irrigation on 8 acres of land. At present the sewage is screened and partially precipitated and then discharged into the river. The new works were necessitated by the action of the East Sussex County Council, taken under the Pollution of Streams Acts. Mr. W. Willis Gale is the engineer for the scheme.

FOREIGN AND COLONIAL.

FRANCE.—The number of demands for admission to compete for the 1900 Exhibition buildings has now risen to 600 (!).——M. Marcel Daly, editor of the *Semaine des Constructeurs*, has been appointed as an expert in connexion with the Council of the Prefecture of the Seine.——The excavations commenced some years ago at Saintes (lower Charente), are to be continued, and an architect has been appointed by Government to direct the works.——The excavations carried on in the little old town of Vezelay have led to the discovery of a good many archæological remains, especially some enamelled tiles of the thirteenth century, Roman and Mediæval coins, and tools. The whole have been placed in the small museum of the town.——M. Formigé has returned to Paris from Orange, where he had been sent by the "Commission des Monuments Historiques," to study the works to be executed at the Roman theatre in preparation for the Classic dramas which are intended to be represented there. According to M. Formigé, the work can only be done very slowly, as he has set himself scrupulously, in repairing the theatre, to preserve intact every stone and moulding of the original building which remains. The work is going on, but it will not be completed for several years.——The seventeenth exhibition of the Fine-Art Society of Nice will be held in the Crédit-Lyonnais building in January.——A committee has been formed in the little town of Cavaillon (Vaucluse) with the object of carrying out the construction of a series of boulevards and promenades in the town. ——The bronze statue to Claude Bernard, the work of the Lyons sculptor, M. Aubert, was inaugurated on Sunday last, in the "Cour d'Honneur" of the buildings of the Faculty of Medicine at Lyons. ——The carelessness of the Fine Arts Department in regard to the curious and interesting ruins of the town of Baux in Provence, which are going to pieces more and more each year, is attracting attention in the South of France. It is intended to appeal to the Government to class them as Historical Monuments, and place them under the care of architectural inspectors.

GERMANY.—The Annual General Meeting of the *Vereinigung Berliner Architekten* was a satisfactory one, as the executive of this energetic Society could report much good work done. There had been several valuable publications; the arrangement of the Architectural section at the Salon; the Congress of German Church Architects; and a number of competitions, excursions, &c., managed under their auspices, as well as the usual meetings, with a number of interesting discussions. Herr von der Hude remains President for the coming Session. The Council will include Herr Kayser (Kayser & Grossheim), Herr Seeling, and Herr Solf.——The Annual General Meeting of the older society, the *Architekten Verein*, did not speak so well for the energy of its Council. The Session 1893-94 was as usual without any special events, except the special meeting held in honour of six members who have now been on the rolls for fifty years. A paper, "Berlin fifty years ago," was read on the occasion. ——The Prussian Royal Academy of Arts invites Prussian architects to compete for a Government Travelling Studentship worth 165*l.* According to the new revised "programme" no special work need be prepared. Candidates can send in drawings of work either carried out, old academical designs, or competition work, and the premium will be awarded to the architect who shows the greatest ability, judged comparatively. The only limit is the age of the candidate, which must not exceed thirty-two.——The subject for the annual Schinkel competition is to be "A National Hall on the lines of Westminster Abbey" (!), whatever that may mean. We are curious to see the particulars of the competition "programme."——The next meeting of the delegates of the various German architectural societies will be held in August, 1895, at Schwerin.—— The next biennial gathering of the amalgamated societies will be held at Berlin in 1896.——Churches seem to be now inaugurated at Berlin at the rate of about one a month. The last two were by Herr Hasack and Herr Moeckel respectively. Herr Hasack's is a Catholic church, costing 18,000*l.* It holds a congregation of 3,000.——We have received a copy of a new illustrated "House and Tenement Gazette," which is being published at Berlin. Every building, flat, or even lodging that is advertised is illustrated by plans set out to scale and with the north point marked on them. "House-hunting" will thereby be greatly facilitated, especially as very complete particulars as to price, &c., are also given.——Workmen are still constantly employed at Cologne Cathedral finishing the extensive "restoration." The official report of the architect in charge, Herr Voigtel, shows that much mosaic-flooring was done during the last twelve months, and that some elaborate wrought-iron railings have been put in hand. A number of tombs have been opened, among others three, under the altar, dating from the sixteenth century.

MISCELLANEOUS.

PROFESSOR HERKOMER ON ART TEACHING.—On the 29th ult. Professor Herkomer delivered a lecture at the London Institution on "Light and Seeing, or Art Tuition." According to the *Daily Graphic*, the lecture began, after the definition that all questions of art turned on the ability to see and to see rightly, with a denunciation of the methods of South Kensington. The result of the South Kensington School's teaching had by no means been a justification of it; it had had all the deadening effect of impersonality; it inaugurated a system of teaching lifeless, humdrum, soul-deadening; it was the despair of masters, the disappointment of students. He would have not a South Kensington system extending all over the kingdom, but a separate school in every town. Each town should work for its own honour. Each school would have an individuality of its own. It was individuality which gave vitality to art. From this general scheme Professor Herkomer passed to an exposition of the principles which should guide the teaching of the individual school. Its great and leading principle should be that the student should be taught to see things as they are. Under this system the drawing from the antique—a mere waste of time—would disappear, and would be replaced by drawing from the life cast. Drawing from the life-cast would be accompanied by painting from the living head, and the ultimate aim of the student, the one thing necessary for the fulfilment of his training, was drawing from the nude—the most elevating, the most inspiring, the most purifying, of all forms of art learning and art practice.

CONFERENCE OF MASTER-PAINTERS AND DECORATORS.—The International Convention of Master-painters and Decorators was resumed on the 21st ult., at the Memorial Hall, Manchester, Mr. George Laidler, of Newcastle-on-Tyne, presiding. Further questions relating to organisation were under consideration.—Mr. John Taylor (Birmingham) read a paper on "The apprenticeship system," in which he urged the importance, in the interests of the standing of the trade, of reviving the system of engaging apprentices by indenture.—On the motion of Mr. Taylor, seconded by Colonel Bennett (Glasgow), it was resolved:—"That it be a recommendation from this meeting to the members of the Institute of House Painters and Decorators, and to the painting trade genarally, that the practice of employing unattached boys be discontinued, and that an earnest endeavour be made to revert to the wholesome habit of indenturing boys to the trade." A paper on "Job Lots and Short Lengths in the Paper-hanging Trade" was read by Mr. W. H. Goodier (Sheffield), who referred particularly to the extent to which job lots of paper-hangings are hawked about the streets and sold by auction, to the detriment of men who are regularly engaged in the trade. The observations of Mr. Goodier were borne out by those who took part in the discussion, and on the motion of Mr. W. G. Sutherland, seconded by Mr. Woodnorth (Whitehaven) it was agreed:—"That this meeting is of opinion that the practices described in Mr. Goodier's paper are inimical to the best interests of the trade, and that a committee be appointed by this Conference to further consider the matter and report upon the same to the executive of the new Association as a basis of concerted action, and further that Mr. Goodier's paper be printed and circulated amongst manufacturers of paper-hangings." There was then an adjournment for luncheon, and before re-assembling the members visited some of the public institutions of the city, including the Town Hall. At the afternoon sitting of the Convention, with Colonel Bennett in the chair, a paper on "The Adulteration of Material" by Mr. J. S. M. Dacombe (Bournemouth), and a paper on "The Training of Master Decorators" by Mr. John Whyte (Aberdeen) were read, in the absence of the writers, by Mr. Cantrill, the Secretary. Mr. Whyte, in his paper, declared that the employers themselves were in a large measure to blame for the present conditions of things they inveighed against. Whilst the universal cry was for technical education amongst the workmen, the employers themselves were in many instances incapable of appreciating any advance their workmen might make—indeed, blocked the way by their own insufficient knowledge and counting-house experience.

He maintained that the laudable ambition of trying to elevate the profession was confined to a small minority of the employers, the main object with the majority being to get the work finished somehow and anyhow—to get it off their hands and another job started. But unless an employer was a practical man and had a thorough appreciation of colour, he was incapable of substantially elevating the profession. To elevate the profession it was necessary that each employer should identify himself with his work as an artist did with his picture or a writer with his book. At a further sitting of the Conference in the evening, with Mr. Alexander White, of Liverpool, in the chair, the chief business was the reading and discussion of a paper by Mr. W. G. Sutherland on "The Relation of the New Association to the Question of Technical Education for Painters."

TECHNICAL EDUCATION.—We have received No. 1 of the *London Technical Education Gazette*, which is announced as the official circular of the Technical Education Board. The first number includes a list of the principal evening classes in Science, Art, and Technology within the County of London. It is not stated at what intervals it will be issued.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—This Society visited, on Saturday last, the works of Messrs. Maudslay, Sons, & Field, of Lambeth, over which they were taken by Mr. G. M. Lemmi on behalf of the firm. The party were first shown the historical portion of the works, which is the birth-place of modern machine-tools, the first self-acting lathe having been invented and constructed by Maudslay. Lathes constructed as long ago as 1800 are still at work, as also are three table-engines constructed as far back as 1824. The members then inspected the engines in course of construction for H.M.S. *Renown*, together with a number of engines for torpedo-boat catcher vessels, a pneumatic dynamite gun, various propellers in phosphor-bronze, cast and wrought steel. They were then taken to the "Belleville" boiler, and were shown the simplicity of its arrangement, the ease and facility with which it is worked, the readiness with which steam can be raised, and the many other good qualities of this boiler. The two warships, *Terrible* and *Powerful*, are to have boilers of this type; the French and the Spaniards have adopted them, and they are in use in some of the largest mail steamships. Another type of water-tube boiler, the "White" is also constructed at these works, it having proved very efficient; it is used principally for the smaller class of vessels, such as torpedo-boats. The party then visited the smithy and foundry and the model-room, containing a number of models of various types of marine engines.

CLOCK, WHITTLE-LE-WOODS.—A large clock has just been erected at the parish church of Whittle-le-Woods, near Chorley. There are three 6-ft. dials, and the hours are struck on a 10-cwt. bell. The work has been carried out generally to the designs of Lord Grimthorpe by Messrs. John Smith & Sons, of Derby.

SURVEYORSHIP APPOINTMENT.—We are informed that Mr. S. Maylan, Nottingham, has been appointed Surveyor and Inspector to the Basford Sanitary Authority, Nottingham, by 19 votes out of 21. There were 98 applicants for the post.

PROTECTION OF IRON COLUMNS.—Some experiments have recently been made by the Buildings Inspection Department of the Vienna Municipality on the protection of iron from fire by encasing it with brick. A wrought-iron column, 12 ft. long, and built up of two channels connected by lattice-bars, was used. This was set up in a small chamber constructed of brick, and the column was loaded by levers. This done, it was surrounded by a 4½-in. brick wall laid in fireclay mortar. The wall did not fit closely round the column, and advantage was taken of this to fix three samples of fusible metals, and which should serve as a gauge of the temperature attained. Various samples of stone, concrete, and other materials were also placed in the chamber. The chamber was then filled with split fire-wood, which was lighted, and the doors were immediately walled up with slabs of plaster of Paris. After the fire had burned out, the doors were broken in, and a stream of water turned into the room from a fire-engine. A subsequent examination of the room showed that the walls of brick laid in Portland cement retained their strength, while most of the natural stones left in the chamber had been destroyed. The ceiling had been lined partly with plaster of Paris and partly with terra-cotta tiles. Both were damaged. The enclosures round the iron pillars was still standing firm, although corners of the brickwork were chipped 1 in. or so, and the fire-clay mortar was largely washed out of the joints. On removing the brick casing, however, the pillar inside was found to be uninjured, even the paint being unscorched, and the fusible plugs only showed a temperature of 149 deg. Fahr.

FLINT-PAPER.—Messrs. G. Ryder Ousey & Co. send us some specimens of their "flint-paper," a powerful variety of what is commonly called sand-paper and which appears to be an exceedingly efficient material, varying from very fine to very coarse and cutting quality. The paper is manufactured at Messrs. Herman, Behr, & Co.'s factories in America, and the description of the mode of manufacture may be of some interest to our readers. The paper which forms the ground is a specially-prepared rope-paper made in continuous rolls. These rolls are then conveyed to the flint-paper factory, and are then unrolled through rollers, and, by a mechanical contrivance, there is deposited an absolutely even layer of glue over the surface of the paper, and instantly, by means of a very ingeniously-contrived hopper, a thin regular deposit of flint is spread over the hot surface of the glue, and the paper is then carried automatically to an overhead railway, which conveys it up and down the whole length of a very extensive floor, hanging in long festoons from the railway nearly to the floor and in a heated atmosphere, thus thoroughly drying the paper, and by the time it reaches the end of its journey, at the extreme opposite corner from which it commenced, it has been exposed to this heat for about half-an-hour, and is then completely dry, and the festoons, on reaching the end, are automatically slipped off the overhead railway, and descend into the next floor, where they go through a machine which slits them lengthways; then into another one, which cuts them into sheets of the desired size, and, by another contrivance, counted into quires, which are then tied up by hand labour; and this is the only time when the hands interfere with the paper in the course of its manufacture. The flint itself is obtained from Messrs. Herman, Behr, & Co.'s flint mine in the Alleghany Mountains, and the quality of the flint is considered to be the hardest in the States. It is crushed in a machine termed a "Devil," which reduces the large flints into small rough fragments, and these are in turn crushed to various sizes, which can be determined to the most minute degree. The flint is then thoroughly washed, to remove all dust, or any other material which is not of the necessary degree of hardness to maintain enough of abraiding surface, is then baked, to get rid of all moisture, and, after being passed through silk, by a process the same as in a flour-mill, it is then ready to be deposited on the paper.

THE PARTHENON AT ATHENS.—According to a recent telegram from Athens, after the great earthquake shocks in Greece last spring a committee was appointed to make an examination of the Parthenon in order to ascertain what damage the temple had sustained. On careful investigation the committee reported that the monument had been seriously injured, and that there was great risk in allowing it to remain in its present dangerous condition. They recommended, therefore, that immediate steps should be taken to strengthen the building. The Archæological Society, at a meeting called to consider the question, have voted an unlimited credit for the purpose of effecting the necessary repairs.

MONUMENT, ST. PAUL'S CATHEDRAL.—The last of the monuments of the Christian Fathers, that of St. Ambrose, was placed in its niche under the dome of St. Paul's on Tuesday. These monuments are eight in number, four of the Greek Fathers—St. John Chrysostom, St. Basil the Great, St. Gregory Nazianzen, and St. Athanasius—executed by Mr. W. F. Woodington, of Brixton-hill, under the superintendence of the Cathedral Architect, Mr. F. C. Penrose; and the four Latin or Western Fathers—St. Jerome, St. Ambrose, St. Augustine, and St. Gregory the Great—designed by Mr. C. E. Kemp, of Nottingham-place, and carried out under his direction by Messrs. Farmer & Brindley, of Westminster Bridge-road. These statues are sculptured out of Bere stone from Seaton. They are 11 ft. 1 in. in height, and they each weigh, including the plinth, about seven tons.

LEGAL.

ACTION FOR ARCHITECT'S FEES AGAINST THE DULWICH CONSTITUTIONAL CLUB.

ON Wednesday, in the Queen's Bench Division of the High Court of Justice, the case of Warner & Co. *v.* Gay and others, was heard before Mr. Justice Cave. It was an action brought by the plaintiffs, Alfred Ernest Warner and Walter Davies, carrying on business as architects and surveyors, as Boulnois & Warner, to recover 72*l.* 17*s.* 9*d.*, for work done and money paid on behalf of the defendants, Thomas Gay, J. Dear, J. H. Taylor, C. M. Campbell, F. G. Marsh, junr., and W. J. Alford, members of the Dulwich Constitutional Club. It was in respect to the preparation of plans of certain alterations of the Club premises, which were not carried out, that the action arose. Mr. Crawford was counsel for the plaintiffs, and Mr. Lynn for the defendants.

Mr. Walter Davies, the plaintiff, in the course of his evidence, admitted that the plans were never carried out. He explained the nature of the work contemplated, which was to embrace an addition at the rear of the hall to cost about 500*l.* Witness produced the plans. In a second plan of additional work, which would cost 150*l.*, there was a fireproof basement to be laid down as well as a fireproof vertical wall, in accordance with the requirements of the County Council. The Committee instructed witness to do the work, and he had paid on account of it for printing, postages, &c., 10*l.*

Mr. Josiah Eliott Holden, surveyor, with twenty-five years' experience, said he was employed by the plaintiffs in connexion with the work, and was present at the club on July 31 last year. Witness heard a group of the members there express satisfaction with the plans, while one of them said to Mr. Davies: "How if this job does not go on? Where do we stand?" Mr. Davies replied: "You will have to pay me the usual 2½ per cent. for the drawings, for the quantities, and lithographing." Witness believed the charges of the plaintiffs to be perfectly fair and reasonable.

Mr. Charles Herbert Shoppee, architect, corroborated as to the reasonableness of the plaintiff's charges.

Mr. Crawford, taking the items seriatim, with the witness, provoked

His Lordship to remark: You are piling up the agony. Seventy-two pounds and nothing to show for it. People will learn from this not to go near an architect.

Mr. Crawford: It is not our fault.

His Lordship: I warn you that you are pitching it a little high.

Witness further stated that the fees were in accordance with the scale of the Institute.

Cross-examined: Had the work been actually done, the cost would have been added to to the extent of 2 per cent.

Mr. Henry Currey, architect and surveyor, having also given evidence for the plaintiffs, their case was closed.

For the defence it was alleged that the plaintiff Davies said that the plans could be prepared for 500*l.*, and agreed to accept 5 per cent. of the actual cost if the building were erected, and a sum of 5*l.* if the plans were not used. By the evidence of the secretary of the club, Mr. Alford, and other members, it appeared that Sir Blundell Maple, the President of the club, had promised 500*l.* towards the club's extension, but that his illness had delayed the execution of the work. It was admitted that in the club's balance-sheet for 1893 the plaintiffs were scheduled as creditors for 50*l.* for the work done.

The learned Judge gave judgment for the plaintiffs, saying that they were entitled to 2½ per cent. for taking out the quantities, which appeared to be the usual charge; he, however, disallowed the expenses for attendance before the County Council. Judgment would therefore be for 56*l.* 19*s.*; and as 10*l.* had already been paid by the defendants, the sum would be reduced to 46*l.* 19*s.*, which, bringing it within the sphere of the County Court, his Lordship made a special order to entitle the plaintiffs to judgment, and accordingly the costs were on the County Court scale.

MEETINGS.

FRIDAY, NOVEMBER 2.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Wallace Peggs on "Water Supply, Drinking Water, Pollution of Water." 8 p.m.

SATURDAY, NOVEMBER 3.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Inspection and Demonstration of the Wimbledon Sewage Works. 3 p.m.

Incorporated Association of Municipal and County Engineers.—Autumn Meeting at Bushey and Hampstead.

SUNDAY, NOVEMBER 4.

Sunday Lecture Society.—Prince Kropotkin on "The Mediæval City: its institutions, life, struggles, and destinies." 4 p.m.

MONDAY, NOVEMBER 5.

Royal Institute of British Architects.—Opening Address by the President, Mr. F. C. Penrose, F.R.S. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. Keith D. Young on "Sanitary Building Construction." 8 p.m.

Society of Engineers.—Adjourned discussion on Mr. T. W. Baker's paper on "The Utilisation of Town Refuse for Generating Steam." 7.30 p.m.

Sanitary Inspectors' Association (St. James's Hall).—Professor Lewes on "The Atmosphere and its Sanitary Relations," IV. 7.30 p.m.

Liverpool Architectural Society.—Mr. E. W. Cox on "The Value of Archæology to Architects as exemplified by the Ruins of Birkenhead Priory." 6.30 p.m.

TUESDAY, NOVEMBER 6.

University Extension Society (Chelsea Centre: Chelsea Town Hall).—Mr. Arnold Mitchell on "English Architecture," V. 3 p.m.

Royal Victoria Hall (Waterloo Bridge Road).—Professor A. W. Rucker, F.R.S., on "The Electric Spark." 8 p.m.

Society of Biblical Archæology.—8 p.m.

Glasgow Architectural Association.—Paper by Mr. J. Kennedy Hunter entitled "On Tramp." 8 p.m.

WEDNESDAY, NOVEMBER 7.

Royal Archæological Institute.—(1) Mr. W. H. St. John Hope, M.A., on "English Municipal Heraldry." (2) Exhibitions of Arms, Seals, &c., of various Boroughs." 4 p.m.

Carpenters' Hall (Lectures to Students on Sanitation).—Professor A. Wynter Blyth on "Sanitary Appliances." 8 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—(1) Inspection and Demonstration in the Parish of St. George's, Hanover-square. 2 p.m. (2) Professor W. H. Corfield on "Sanitary Appliances." 8 p.m.

Builders' Foremen and Clerks of Works Institution.—Ordinary Meeting. 8 p.m.

Liverpool Engineering Society.—8 p.m.

THURSDAY, NOVEMBER 8.

Sanitary Institute (Sanitation of Industries and Occupations).—Mr. C. Le Neve Foster on "Quarrying of various kinds: Granite, Marble, Stone, Slate, Chalk, and Limestone." 8 p.m.

Institution of Electrical Engineers.—(1) Mr. H. D. Wilkinson on "Electric Tramways in the United States and Canada." (2) Messrs. R. W. Blackwell and Philip

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Church, Elmwood-avenue, Belfast.....	Building Committee..	40*l.* and 20*l.*	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Kerbing, &c. near Bristol	St. George U.S.A.	T. L. Lewis	Nov. 6
Street Works, Crossford-street, Stretford, Manchester	.....	Jno. Bowden	do.
Catholic Presbytery, Bridlington Quay ..	.....	Smith, Brodrick, & Lowther	do.
*Broken Granite	East Ham Local Board	W. Savage	do.
*Wrought Iron Unclimbable Fencing.....	do.	do.	do.
*Wooden Fencing	do.	do.	do.
Cleo Hill Granite, &c.....	Windsor U.S.A.	*Official*	do.
Making-up Dryden and other Roads.....	Wimbledon Loc. Bd...	do.	do.
*Kerbing, Tarpaving, Metalling, &c. Works	Lewisham Bd. of Wks.	do.	do.
Pipe Sewer and Tank, Cawthorne.....	Penistone (Yorks.) U.R.S.A.....	do.	Nov. 7
Sewerage Works, Staplegrove	Taunton R.S.A.	do.	do.
Additions to Premises, Abergavenny	W. J. Day.....	Brut.n & Williams ..	do.
Alterations, &c. to Schools, Bainton, Stamford	Lord Kesteven.....	.....	do.
Schools, Cyprus-terrace, Barnstaple	.....	G. C. Smyth-Richards	do.
Drainage Work, Scotland-street, Stoke-by-Nayland, Suffolk	.....	Arthur Green	do.
House, near Newhills, Aberdeen.....	.....	Wm. Ruxton	do.
Pipe Sewer, Manholes, &c. Dumfries.....	Maxwelltown Town C	J. H. Barbour	do.
Schools (Wesleyan), Richmond Hill, Leeds	.....	G. F. Danby	Nov. 9
Farmhouse, Forder, South Brent, Devon..	A. Knapman	.....	do.
Brick and Pipe Sewer (930 yds.), Aire to Pitt-street	Keighley Corporation	W. H. Hopkinson	Nov. 10
Sewers, Tanks, &c. Whitchurch	Cardiff U.R.S.A.....	W. Fraser	do.
Schools, &c. West Bagborough, Taunton..	.....	G. C. Strawbridge....	do.
Additions to Schools, Ruabon	National Sch. Mngrs.	... .	do.
Alterations to National Schools, Debenham	The Vicar	.....	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Pipe Sewer, Grahame-street.....	Leith (N.B.) Council	*Official*	Nov. 10
Wood and Granite Paving.....	Truro U.S.A.	do.	do.
Sewerage Works	Arnsley (Yorks) Local Board	Mr. Harper	Nov. 12
Sewers, &c. Delph and other Places	Saddleworth (Lancs.) R.S.A.	T. S. M'Callum	do.
Alterations to Schools, Penygraig, Glam.	Ystradyfodwg Sch. Bd.	J. Rees	do.
Bridge Work, Plumbland	Cockermouth Highway Authority	J. B. Wilson.....	Nov. 13
*Alterations, &c. to Schools.....	Harrow-on-the-Hill with Pinner Sch. Bd.	Houston & Houston ..	do.
*Roadmaking and Sewering, Peckham	.....	Mr. Poole	do.
Schools	Stifford (Essex) Sch. Bd.	A. J. Gale	Nov. 14
Draining Aboyne Estates, near Aberdeen	John Campbell	.....	do.
Drainage, Newburgh, Foveran, N.B.....	Ellon District Com. ..	J. A. Beattie	do.
*Drainage Machinery.....	East Molesey Loc. Bd.	J. C. Melliss	do.
*Infant School	Dagenham Sch. Bd. ..	Wigg, Oliver, & Hudson.....	Nov. 15
*School Buildings	Wednesfield Sch. Bd...	T. H. Fleeming	Nov. 16
*New School Buildings.....	High Ongar Sch. Bd...	Mr. Mawhood	Nov. 19
*Drainage and Alterations at Workhouse ..	Ware Union	Newman & Newman..	do.
*Urinal, Hampstead Heath	London County Council	*Official*	Nov. 21
House at Schools, Ashton Gate	Bristol School Board..	F. B. Bond	Nov. 29
Sewerage Works, &c.	Neath R.S.A.	W. E. Clason Thomas	Dec. 5
Church Schools, Talke, Staffordshire ...	.....	J. Hall Gibbons	No date
Eleven Houses, Clayton, &c. Streets, Westgate, Wakefield	.....	Hart & Dawson	do.
Church Tower, Castlecauldfeld, co. Tyrone	Rev. F. Tichborne	.....	do.
Three Houses, Hanover-square, Leeds	Geo. Lax, junr.	.....	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Sanitary Inspector	Battersea Vestry	101*l.*.....	Nov. 9
*Surveyor and Engineer	Gainsboro' Local Bd.	175*l.* &c.	Nov. 15
*Engineer and Surveyor	Council of City of Cape Town	800*l.* &c.	Dec. 21

Those marked with an asterisk (*) are advertised in this Number. *Competition, p.* iv. *Contracts, pp.* iv., vi., *and* viii. *Public Appointments, p.* xviii.

Dawson on "Electric Traction, with special reference to the installation of Elevated Conductors." 8 p.m.

Northern Architectural Association (University Extension Lecture).—Mr. D. H. S. Cranage on "The Perpendicular Style." 7 p.m.

FRIDAY, NOVEMBER 9.

Architectural Association.—Mr. A. Beresford Pite on "The Study of Modern Architecture." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Wright Clarke on "Details of Plumbers' Work." 8 p.m.

SATURDAY, NOVEMBER 10.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Inspection of Harrison & Barber's Knacker Yard, Whitechapel.

Dundee Institute of Architecture.—Annual Conversazione.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

17,805.—FLUSHING WATER-CLOSETS: *J. Dean.*—A charging vessel is divided into one or two compartments by flexible diaphragms, one of which—the centre one—is filled with compressed air. The two outer compartments are acted upon alternately by the water pressure from the main and the expansive force, and arrangements are made for the delivery at the same time of a small quantity of liquid disinfectant.

18,387.—WINDOW-SASHES: *A. Pickard.*—According to this invention, one sash is made to balance the other, and the inner guide-rails, or staff-heads, are omitted, to allow of the bottom sash being raised to the top of the window-frame, and drawn inwards for cleaning.

20,421.—SEWER-VENTILATION: *T. Cainh.*—Where cotton-wool or other medium is used for filtering the air or gas, provision is by this invention made for preventing the condensation of vapours which would render the material useless.

20,515.—FLUSHING WATER-CLOSETS, &c.: *F. Patterson.*—To secure efficiency and economy in the use of water, mechanical details are described at some length, the object of which is to control the supply of water, and render the works less liable to derangement than other forms in general use.

21,292.—PORTLAND CEMENT, PIGMENTS, &c.: *A. Patrick.*—The important part of the invention consists in the preparation and separation of the ingredients in a state of fine pulverisation, free from gritty and insufficiently-ground particles. The materials are ground dry, and, by means of a blower, are forced to the underside of a screen and through the meshes, which allows of much finer particles being used.

22,805.—PUG OR MORTAR MILLS: *G. O. Wallis.*—The object of this invention is to automatically discharge the contents of the mill into barrows, carts, or trucks. The mill is formed with a revolving pan, having a discharge hole into which a plug is fitted. This is arranged to be opened and closed by a lever or levers, which also actuate a scraper guiding the materials from the discharge-hole to the barrows, carts, or trucks underneath.

1,366.—DOORS AND GATES: *J. Rumgay.*—The hinges are replaced by pivots and inclined planes, which cause the door to return to a closed position by its own weight. Special methods of fixing are used.

5,071.—CEMENT: *G. W. A. Stein (Germany).*—To prevent disentegration when handled, before burning of the raw material in bricks, these bricks are made to quickly set by the admixture of slag-sand and hydrate of lime.

NEW APPLICATIONS FOR LETTERS PATENT.

OCTOBER 15.—19,534, J. Tuke, Sanitary Pipes and Joints for same.—19,538, C. Milne & R. Barron, Sliding-sash Windows, &c.—19,549, A. Lilley, Drying Bricks, &c.—19,553, H. Harvey & J. Union, Sash-fasteners for windows, and Safety-catches for door-latches.—19,554, W. Burland, Door-closing Appliance, &c.—19,574, W. Youlten, Sliding-sash Boxed Frames.—19,576, J. Craven, Moulding Bricks, Tiles, &c.

OCTOBER 16.—19,624, E. Handslip and others, Chimney-cowls.—19,627, W. Owen, Artificial Stone.—19,650, T. Houghton, Windows.—19,659, C. Darrah & J. Kay, Water-closet Seats and Lids.—19,711, B. Dawson, Kilns for burning bricks, pottery, &c.

OCTOBER 17.—19,737, J. Wheeler, Material for Roofing, Weathering, and Decorative purposes.—19,750, A. Haddow, Syphon Flushing-cisterns.—19,773, J. Biggs, Ventilation of Sewers.—19,777, H. Pecknold, Screw-driver Brace-bit.—19,779, G. Wishart & A. Jeffrey, Cased Windows.—19,787, J. Dresden & Co., Ltd., & F. Breeden, Flushing Apparatus for Water-closets, &c.—19,788, A. Markmann & J. Wetjen, Machine for the Attachment of Paper-hangings by adhesive means.

OCTOBER 18.—19,813, S. Cooper, Attaching Sash-cords to Windows.—19,829, J. Tulloch, Tubular Bricks or Blocks, and Wall-linings for Fireproof Buildings.—19,851, P. Bunn, Finger-plates.—19,856, E. Youell, Combined Circular or Straight Wood-moulding Machine.—19,884, J. Bloxam, Band-saws.—19,891, J. Maskelyne, Door-spring.—19,892, J. Wilson, Fire-resisting Constructions, &c.

OCTOBER 19.—19,910, T. Marchants, Wood block Sawing Machines.—19,928, B. Williams, Parquet-fastener.—19,933, M. McNamara, Flushing-cisterns.—19,949, H. Bridgman, Smoky-chimney Curer.—19,956, W. Calvert, Sink-traps, &c.—19,961, J. Armstrong, Drain-testing Machine.

OCTOBER 20.—20,028, W. Ralph, Door-stop and Spring. 20,005, W. Calvert, Street-gulley.

PROVISIONAL SPECIFICATIONS ACCEPTED.

16,654, J. Sheppard and F. Dashwood, Continuous Concrete Structures.—17,119, J. Byfield, Sash-fastener.—17,487, G. Skinner, Paint Spraying Appliances, worked by Compressed Air.—18,508, A. Boult, Band-saws for Cutting Blocks of Marble or other Stone.—18,597, R. Greenwood, Gulley-traps.—18,671, V. Lennard, Disinfecting Apparatus for use in Water-closets, Urinals, Lavatories, &c.—18,693, J. Fielden, Chimney-pot.—18,734, A. Chappell, Fire-grate.—18,793, H. Kerr, Windows.—18,961, R. Pye, Moistening, Heating, Cooling and Ventilating Factories, &c.—19,056, W. & P. Wheeler, Apparatus for Curing Smoky Chimneys, and for Ventilating purposes.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

24,332, F. Brook, Gullies.—24,380, W. Nicol, Window-sashes.—1,047, H. Birkbeck, Collapsible Doors.—12,350, W. Bruch, Hydraulic Cement.—14,877, J. Travis, Sash-fasteners for Windows.—17,544, E. Tessen, Compounds for Destroying or Removing Old Paints.—17,597, W. Lake, Apparatus for Making Mortar.—17,653, F. Orwin, Chimney-pots, &c.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

OCTOBER 13.—By *E. H. Ellis* (at Guildford): An enclosure of f. land, 5a. 1r. 14p., Worplesdon Station, 310*l.*; enclosures of f. land, 8a. or. 35p., 485*l.*; three f. cottages and a plot of land, 370*l.*; two plots of f. land, 92*l.*

OCTOBER 22.—By *Baxter, Payne, & Lepper:* 10 and 11, Ellesmere Villas, Wimbledon, u.t. 95 yrs., g.r. 13*l.*, r. 50*l.*, 300*l.*—By *G. Simmins & Ellis:* 17 and 19, Granard-rd., Wandsworth, u.t. 87 yrs., g.r. 18*l.*, r. 90*l.*, 800*l.*; 26 to 32 even, Heyford-av., Lambeth, u.t. 93 yrs., g.r. 34*l.*, r. 1,605*l.*; 124 and 126, Wickersley-rd., Battersea, u.t. 74 yrs., g.r. 5*l.*, 395*l.*—By *Harman Bros.*: 161, High-st., Stoke Newington, f., r. 350*l.*, 5,600*l.*; 37 and 39, Glengall-rd., Old Kent-rd., f., r. 74*l.*, 1,050*l.*; 44 to 52 even, Cooper's-rd., u.t. 90 yrs., g.r. 32*l.* 10s., r. 170*l.*, 1,375*l.*—By *Lilley & Western*: 34, Delamere-cres., Paddington, u.t. 56 yrs., g.r. 21*l.*, 255*l.*; 10, Bosworth-rd., Kensington, u.t. 72 yrs, g.r. 7*l.*, r. 26*l.*, 125*l.*; 59, Herries-st., Kilburn, u.t. 82 yrs., g.r. 5*l.*, 235*l.*; 131, Lancefield-st., u.t 83 yrs,, g.r. 5*l.*, 210*l.*

OCTOBER 23.—By *C. P. Whiteley:* 105 and 106, Widmore-rd., Bromley, f., r. 180*l.*, 3,210*l.*; 18 and 19, Market-sq., f., r. 150*l.*, area 8,300 ft., 2,700*l.*; 17, Market-sq., f., r. 60*l.*, 1,025*l.*—By *C. W. Davies:* 21 and 36, Edward-sq., King's Cross, u.t. 45 yrs., g.r. 10*l.*, r. 76*l.* 16s., 450*l.*; 113, Milton-rd., Stoke Newington, u.t. 56 yrs., g.r. 6*l.*, r. 28*l.* 230*l.*—By *B. Brown:* 152, Salmon's-lane, Limehouse, f. r. 55*l.*, 1,000*l.*—By *H. J. E. Brake:* The Holdstone Estate Combmartin, Devon, 250 acres, 1,968*l.*; two plots of land Myddleton-rd., Bowts Park, f., 165*l.*; a plot of building land, Ditton-rd., Surbiton, f., 60*l.*

OCTOBER 24.—By *Inman Sharp, Harrington, & Roberts:* 1, Oakley-sq., Hampstead-rd., u.t. 49 yrs., g.r. 5*l.*, 700*l.*; f.g.r. of 21*l.* 7s. 6d., Canbury Pk.-rd., Kingston, reversion in 86 yrs., 400*l.*; f.g.r. of 9*l.*, Cambridge-rd., reversion in 66 yrs., 175*l.*; f.g.r. of 26*l.* 10s., Denzil-rd., Willesden, reversion in 86 yrs., 590*l.*; f.g.r. of 21*l.*, Langthorne-st., West Ham, reversion in 26 yrs., 530*l.*; f.g.r. of 21*l.*, Dartmouth-ter., Leyton, reversion in 71 yrs., 470*l.*; 26, 28, 30, 32, 34, 38, 40, 46, and 48, Wisteria-rd., Lewisham, f., r. 256*l.*, 3,195*l.*; 85, Barnsbury-st., Islington, u.t. 15 yrs, g.r. 9*l.*, r. 40*l.*, 140*l.*—By *Dowsett, Knight & Co.*: The "Red Lion and Star" public-house, Strood, Kent, and 1 and 2, North-st., f., 3,100*l.*; 72, Wickham-rd., Brockley, u.t. 83 yrs., g.r. 1*l.*, 860*l.*—By *J. H. Bulmer:* 14 to 17, Manor-lane, Rotherhithe, u.t. 56 yrs., g.r. 9*l.*, 565*l.*; 54, Ainsty-st., f., 95*l.*—By *J. & R. Kemp & Co.*: 6, 8, and 10, Bloemfontein-av., Shepherd's Bush, u.t. 85 yrs., g.r. 13*l.* 10s., 645*l.*

OCTOBER 25.—By *Newbon & Co.*: 93, Highbury Quadrant, Highbury, u.t. 55 yrs., g.r. 15*l.* 15s., 500*l.*: 8, Stavordale-rd., u.t. 82 yrs., g.r. 8*l.*, r. 45*l.*, 400*l.*; 251, Evering-rd., Clapton, u.t. 80 yrs., g.r. 8*l.*, 505*l.*; 39, Story-st., Caledonian-rd., u.t. 50 yrs., g.r. 6*l.*, r. 52*l.*, 250*l.*; 118, 122, and 124, Lordship-rd., Stoke Newington, u.t. 63 yrs., g.r. 30*l.*, 1,185*l.*—By *Segrave Browett & Taylor:* F.g.r. of 7*l.*, Gee-st., Goswell-rd., reversion in 47 yrs., 187*l.* 10s.; f.g.r. of 51*l.*, Gee-st., reversion in 47 yrs., 1,320*l.* 10s.; f.g.r. of 28*l.*, Hart's-ct., Aldersgate-st., reversion in 46 yrs., 705*l.*; f.g.r. of 20*l.*, Bridgwater pl., reversion in 73 yrs., 485*l.*—By *Farebrother, Ellis Clark & Co.*: The F residence, "Strathfield," Thurlow Pk.-rd., Dulwich, 1,000*l.*—By *C. C. & T. Moore*: 29, The Grove, Hackney, f., r. 38*l.*, 460*l.*; i.g.r. of 9*l.* 15s., Morville-st., Bow, u.t. 53 yrs., g.r. 2*l.* 15s., 110*l.*; "Ravenswood," Coleworth-rd., Leytonstone, f., r. 30*l.*, 425*l.*; 2 and 4, Stainsby-rd., Poplar, f., r. 85*l.*, 1,190*l.*; f.g.r. of 3*l.*, Canton-st., reversion in 24 yrs., 140*l.*, 205, Salmon's-lane, Limehouse, f., 830*l.*; Red Mead-lane, Wapping, f. stabling, r. 76*l.*, 400*l.*—By *Stimson & Sons:* 148, Turner's-rd., Mile End, u.t. 67 yrs., g.r. 5*l.*, 220*l.* 60, Josephine-av., Brixton, u.t. 71 yrs., g.r. 14*l.*, r. 70*l.*, 550*l.*; 81, High-st., Putney, u.t. 84 yrs., g.r. 28*l.*, r. 140*l.*, 2,275*l.*; 83, High-st., u.t. 84 yrs., g.r. 28*l.*, r. 140*l.*, 2 235*l.*; 84 and 86, Lower Kennington-lane, Lambeth, u.t. 44 yrs., g.r. 13*l.*, r. 115*l.*, 1,220*l.*

OCTOBER 26.—By *Dolman & Pearce:* 28, England's-lane, Hampstead, u.t. 68 yrs., g.r. 5s., 2,150*l.*; 15, Fellows-rd., u.t. 67 yrs., gr. 12*l.* 10s., 860*l.*; 111, Granville-rd., Kilburn, u.t. 68 yrs., g.r. 8*l.* 10s., 125*l.*—By *W. W. Read & Co.*: "Fairview Cottage," Foyle-rd., Tottenham, u.t. 84 yrs., g.r. 5*l.*, 65*l.*; 45 and 47, St. Leonard-st., Bow, u.t. 59 yrs., g.r. 8*l.*, r. 60*l.*, 550*l.*; 19 and 20, Cottage-lane,

City-rd., u.t. 48 yrs., g.r. 10*l.* 10*s.*, 345*l.*; f.g.r. of 9*l.*, County Terrace-st., New Kent-rd., reversion in 78 yrs., 180*l.*—By *J. Hibbard & Sons:* 2, Lacon-rd., Dulwich, f., 280*l.*; 25 and 29, Crawthew-rd., f., 430*l.*; 48, Archdale-rd., f., 205*l.*; 98, New-pk., Highbury, u.t. 55 yrs., g.r. 12*l.*, 960*l.*; 41, Kenninghall-rd., Clapton, u.t. 81 yrs., g.r. 10*l.*, r. 45*l.*, 340*l.*; 24, Brecknock-rd., Camden-rd., u.t. 21 yrs., g.r. 15*l.* 14*s.*, r. 75*l.*, 700*l.*; 42 to 52 even, Asplins-rd., Tottenham, f., 920*l.*; 31, 32, and 33, Albert-rd, New Town, Waltham, f., 250*l.*; 57, Grosvenor-rd., Aldershot, f., r. 25*l.*, 360*l.*; 11, Cranfield-rd., Brockley, u.t. 70 yrs., g.r. 3*l.* 4*s.*, r. 25*l.*, 230*l.*; an improved rental of 65*l.*, Hoxton-st., Hoxton, u.t. 65 yrs., 930*l.*; "Hatonia," Deptford Bridge, u.t. 67 yrs., g.r. 40*l.*, r. 150*l.*, 1,320*l.*; 9 to 12, Grange Ct.-rd, Stoke Newington, u.t. 81 yrs., g.r. 30*l.* 9*s.*, r. 152*l.*, 1,345*l.*: 49 to 55 odd, Beresford-rd., Canonbury, u.t. 55 yrs., g.r. 33*l.* 14*s.*, r. 225*l.*, 2,025*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.

Greenheart, B.G. ton	8/0/0	0/0/0
Teak, E.I. .. load	10/0/0	16/0/0
Sequoia, U.S.ft.cu	1 10	2/2
Ash, Canada load	3/0/0	4/5/0
Birch, do.	2/15/0	4/0/0
Elm, do.	3/15/0	5/0/0
Fir, Dantsic, &c.	1/12/0	3/5/0
Oak, do.	2/10/0	4/10/0
Canada	5/15/0	7/5/0
Pine, Canada red	2/10/0	3/0/0
Do. Yellow	3/0/0	5/5/0
Lath, Dantsic, fath	4/10/0	5/12/0
St. Petersburg..	5/0/0	6/10/0
Wainscot, Riga, &c., log	2/15/0	5/0/0
Odessa, crown	2/15/0	5/0/0
Deals, Finland 1nd & 1st std 100	7/0/0	9/0/0
Do. 4th & 3rd ..	7/0/0	8/0/0
Do. Riga	7/0/0	8/10/0
St. Petersburg, 1st yellow	9 10/0	12/10/0
Do. 2nd yellow	7/10/0	9 10 0
Do. white	8/0/0	10/10/0
Swedish	7/0/0	15 10/0
White Sea	6/10/0	14 10/0
Canada, Pine 1st	22/0/0	26 10/0
Do. do. 2nd	17/0/0	18/0/0
Do. do. 3rd, &c.	7/10/0	10/10/0
Do. Spruce, 1st	8 12/0	10/0/0
Do. do. 3rd & 2nd	6/10/0	7/10/0
New Brunswick	6/0/0	7/0/0
Battens, all kinds	3/0/0	15/0/0
Flooring boards, 1¼, 1 in., prep.	0/9/6	0/14/6
Do. 2nd	0/7/0	0/11/6
Other qualities	0/5/0	0/6/6
Cedar, Cuba .. ft.	/3½	/4½
Honduras, &c.	/3½	/4½
Mahogany, Cuba	/3½	/6
St. Domingo, cargo av.	/3	1/6
Mexican do. do.	/3	/4
Tobasco do. do.	/3½	/6
Honduras do. ..	/3½	/5½
Box, Turkey ton	4/0/0	13/0/0
Rose, Rio	7/0/0	18/0/0
Bahia	6/2/0	17/0/0
Satin, St. Domingo	0/0/5	0/1/0

TIMBER (*continued*).

Satin, Porto Rico	0/2/6	0/2/6
Walnut, Italian ..	0/0/3½	0/0/7

METALS.

Iron—Pig, in Scotland ton	2 2 6½	0/0/0
Bar, Welsh, in London	5/12/6	5 15/0
Do. do. at works in Wales	5/2/6	5/5/0
Do. Staffordshire, in London	6/0/0	6/10/0
COPPER—British cake and ingot	43 10/0	44/0/0
Best selected ..	44/0/0	44 10 0
Sheets, strong ..	51/10/0	0 0/0
Chili, bars	40/13/9	41 18 9
YELLOW METAL lb	0/0/4¼	0/0/4¾
LEAD—Pig, Spanish ton	9/16 3	9 17 6
English com. brands	9/18 9	10/0/0
Sheet, English, 6 lbs. per sq. ft. and upwards	10/15/0	11 0 0
Pipe	12/15/0	0/0/0
ZINC—English sheet ton	18/10/0	19/0/0
Vieille Montagne	19/10/0	0/0/0
TIN—Straits	67/7/6	67/17/6
Australian	67/10/0	68 0/0
English Ingots..	70 0/0	70 10/0
Banca	69 0/0	69 10/0
Billiton	69/0/0	69 5/0

OILS.

Linseed ton	20/10/0	21/0/0
Cocoanut, Cochin	28/0/0	28 10/0
Do. Ceylon	24 0/0	0 0/0
Palm, Lagos	25/10/0	0/0/0
Rapeseed, English pale	20 15/0	0/0/0
Do. brown	19/5 0	0/0/0
Cottonseed ref.	18/10/0	19 10/0
Oleine	22/0/0	24/0/0
Lubricating, U.S.	4/0/0	5/0/0
Do. refined	5/0/0	12/0/0
TAR—Stockholm barrel	1 1/0	0/0/0
Archangel	0 12 0	0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursday.*]

BARNET.—For the supply of 400 tons broken granite, for the Local Board:—

	Per ton. s. d.		Per ton. s. d.
Old Radnor Company	15 7	W. Griffiths	11 0
Mundy & Co.	12 2	Guardians, Barnet Union, Barnet*	11 0
H. F. Brooks	12 0	Mountsorrel Granite Co.	11 0
L. Sommerfeld	11 5	Enderby Granite Co.	10 10
Kaltenbach & Schmitz	11 3	Saml. Trickett & Sons	10 10
E. J. Van Praagh	11 3	Fergusson & Starkey	10 10
A. F. Manuelle	11 3	Ireland & Knight	10 9
Croft Granite Company	11 1	* Accepted.	
Whitwick Granite Co.	11 1		

BARNSLEY.—Accepted for the erection of school buildings, Senior-lane, Royston, for the Royston School Board. Messrs. Senior & Clegg, architects, 15, Regent-street, Barnsley. Quantities by architects:—
C. & E. Cutts, Royston, near Barnsley £5,900

BASFORD (Notts).—For the erection of a hospital for infectious diseases, &c., for the Union Rural Sanitary Authority. Mr. Herbert Walker, Architect, Newcastle-chambers, Nottingham. Quantities by the Architect:—

W. Moss & Son	£12,291 13 3	F. Messom	£8,970 0 0
E. Hind	9,634 0 0	W. Maule	8,960 0 0
J. F. Price	9,332 6 6	J. G. Thomas	8,895 13 0
W. E. Shaw	9 299 0 0	J. H. Vickers	8,895 0 0
Hodson & Son	9,278 0 0	Dennett & Williamson	8,839 0 0
J. Shaw	9,267 11 0	F. Evans	8,672 0 0
W. Woodsend	9,196 0 0	H. Vickers, Nottingham (accepted)	8,512 0 0
J. Wheatley	9,075 0 0		
F. Barlow	9,044 6 6		
Hopewell & Son	9,038 15 10		

BOURNE END.—For new bungalow and chalet proposed to be built for Mr. F. C. Frye, M.P., at Bourne End. Mr. Arthur Vernon, architect, 29, Cockspur-street, London, S.W., and High Wycombe:—

Bungalow.

Edwards	£1,464 0	Hunt	£1,270 0
C. W. Cox	1,446 0	Nash	1,269 0
Barker	1,387 0	Flint	1,227 0
Webster & Cannon	1,358 0	Martin	1,220 0
Gibson	1,345 0	H. Harris	1,213 10
Silver	1,338 0	Loosley	1,205 0
Geist	1,338 0	J. T. Harris	1,187 0
Dickens	1,289 0	Smith	1,121 0

Chalet.

Edwards	£1,316 0	Grist	£1,118 0
Cox	1,315 0	Loosley	1,115 0
Silver	1,219 0	Nash	1,094 0
Barker	1,190 0	Martin	1,091 0
Webster & Cannon	1,182 0	Flint	1,069 0
H. Harris	1,160 10	J. T. Harris	1,054 0
Gibson	1,160 0	Smith	1,050 0
Geist	1,124 0	Dickens	1,039 0

BEDLINGTON.—Accepted for the execution of waterworks (four contracts); also for settling-tanks, Humford Mill, &c., for the Local Board. Mr. W. W. Cooper, Surveyor, Bedlington. Quantities by the Surveyor:—

Halliday & Co. (No. 1), Manchester	£1,426 0 0	High-pressure filters.	
Smith, Patterson, & Co. (2), Blaydon-on-Tyne	245 0 0	Pipes & valves.	
" " "	6 9	Special castings per cwt.	
Williamson & Son (3), Sunderland	296 0 0	Settling-tanks.	
" " "		Under schedule. Pipe-laying.	
Gordon & Hume (4), Bedlington	288 0 0	Filter-house.	

BRACKNELL.—For alterations to Priestwood House. Mr. J. T. Lawrence, architect, Leighton Buzzard, Beds:—

G. Brown	£247 0	E. Wheeler	£145 0
Parker	175 0	W. May (accepted)	130 0
G. East	160 0	H. Clark	129 7

BRIGHTON.—For new billiard-room at 7, Ship-street, Brighton. Mr. Arthur Loader, architect:—

With double-domed roof.

W. Botting & Son	£1,240	Sattin & Evershed	£1,127
G. R. Lockyer	1,233	V. P. Freeman	1,096
J. Barnes	1,190	J. J. G. Saunders & Son	1,082
W. A. Field & Co.	1,157	Patching & Sons	1,078
W. Taylor	1,130		

(Alternative) with single-dome roof.

W. Taylor	£960 0	Patching & Sons	£852 0
Garrett	928 0	Kemp	845 0
W. Botting	895 0	I. J. G. Saunders & Son	835 10
W. A. Field & Co.	887 0	V. P. Freeman	824 0
J. Barnes	884 0	Sattin & Evershed *	810 0
		* Accepted.	

BRISTOL.—For new caretaker's house, Ashton Gate Schools. Mr. F. Bligh Bond, architect, Liverpool Chambers, Bristol. Quantities supplied:—

Bale & Westlake	£475	Easterbrook & Sons	£359
J. Lovett	408	Hatherley & Carr	347
W. Church	397	G. H. Wilkins	340
J. Reed	373	Wilkins & Gosling	323
G. Humphreys	365	C. A. Hayes	295
J. errott	364	J. Browning (accepted)	282
E. Walters	360		

CAMELFORD (Cornwall).—For the construction of water-supply works, Boscastle, for the Rural Sanitary Authority. Mr. R. H. Worth, engineer, 42, George-street, Plymouth. Quantities by Engineer:—

Garton & King	£926 5 11	D. Porter, Mansion House Chambers, London (accepted)	£625 0 0
Thomas & Son	784 7 11		
E. J. Duke	671 2 9		

CAMPBELLTOWN (N.B.).—For the erection of a pier or jetty, for the Inverness-shire County Council. Mr. R. Black, C.E., 22, Union-street, Inverness:—

John Best	£1,527 0 0	Forbes & McLeod	£1,090 0 0
Bain & McLeod	1,483 0 0	Roderick Fraser, Inverness*	983 0 0
P. C. Brebner	1,220 0 0	* Accepted.	
Alex. McGregor	1,138 12 2		

[Engineer's estimate, £1,000.]

CAERPHILLY (Wales).—For the construction of 500 yards 12-in. sewer, &c., Senghenydd, for the Local Board. Mr. D. H. Daniel, Surveyor, Local Board Offices, Caerphilly:—

D. Jenkins	£501 0 6	Frank Ashby	£262 10 6
M. Williams	316 6 8	E. H. Page	251 14 5
Gibbon & James	311 19 5	Wm. Lewis	253 15 11
R. J. Mathias	308 8 0	Barnes, Chaplin, & Co.	250 5 4
Wm. Jenkins	299 7 0	Michael Gibbon	239 10 8½
D. Evans & Son	295 6 9	Thos. Harris, Cardiff*	221 9 9
Jno. Winnel	281 16 0	* Accepted.	
Thos. Taylor	264 3 11		

CORSHAM (Wiltshire).—For additions and alterations to Neston Schools, for the Corsham School Board. Mr. Harold Brakspear, architect:—

Osborne & Co.	£367 0 0	W. H. Bromley*	£322 12 6
Merritt & Collett	335 10 0		

*Accepted and approved by the Education Department.

CROYDON.—For additions to school buildings, Whitehorse-road, Thornton Heath, for the School Board. Mr. Robert Ridge, architect. Quantities by architect:—

Umlauf & Nicoll	£893	J. Smith & Sons	£645
J. & C. Bowyer	708	Huntley Bros.	618
P. R. Hubbard	700	A. Bullock, Tanfield-road, Croydon (accepted)	569
T. C. Hobbs	693		
W. Akers & Co.	687		

HENDON (Middlesex).—Accepted for conservatory, &c., for Mr. W. R. Bousfield, Q.C., M.P. Mr. George Hornblower, architect, 20, Fitzroy-street, W.:—
William Tout £255

HIGH WYCOMBE (Bucks).—For new warehouse, &c., High-street, for Mr. Alfred Leadbetter. Mr. Arthur Vernon, architect, 29, Cockspur-street, London, S.W., and High Wycombe:—

Nash	£528 0	Flint	£427 0
H. Harris	525 10	Gibson	415 0
Hunt	457 0	Loosley	402 0
Dickens	454 0	J. T. Harris	382 0
Webster & Cannon	449 10	Smith	380 0

HODDLESDEN (Lancs.).—For the erection of five houses, for the Co-operative Society. Mr. John B. Thornley, architect, 45, Market-street, Darwen:—

H. Lloyd & Sons	£1,000	R. Shorrock	£975
Whalley & Walmsley	990	A. Walsh*	860
W. Sharples	975	T. Nightingale	840

Plumbing.

R. Entwisle	£59 0	Duffy & Wrighton*	£41 5
H. Upsen	45 0	* Accepted.	

[All of Darwen.]

IDLE (Yorks.).—For sewering, levelling, and making good Blenheim-place, &c., for the Local Board. Mr. Naylor, Surveyor, Idle Local Board:—

	Doctor-lane.	Rawson-square.	Blenheim-place.
Jos. Ross & Son, Windhill, Shipley, Yorks	£125 5 5	£58 0 8	£50 14 2

ILFORD.—For new Wesleyan Methodist church, High-street, Ilford, Essex. Mr. J. H. Carte, architect, Upton Park, E. Quantities by Mr. Henry Theobald, F.S.I., 87, Finsbury Pavement, E.C.:—

G. Hosking	£5,067	Gregar & Son	£4,367
F. Voller	4,880	R. Stroud	4,362
Harris & Wardrop	4,730	Chessum & Son	4,310
Atkin & Green	4,650	G. Sharpe	4,295
S. J. Scott	4,549	W. Watson	4 280
H. L. Holloway	4,540	J. Pappin	4,277

LONDON.—For decorative and sanitary repairs at 220, Earl's Court-road, S.W. Messrs. Morley & Letts, Surveyors, 185, Earl's Court-road:—

Myring & Co.	£340	Simmonds Bros.	£309
T. F. Williams	322	James Whitaker	292

LONDON.—For the erection of fence-wall connected with the widening of Swain's-lane, Highgate, for the St. Pancras Vestry:—

Steed	£181 10 0	H. G. Davenall, Southampton-buildings, Gospel Oak*	£146 0
H. Wall	159 0 0		
Killingback	153 7 3		
		* Accepted.	

LONDON.—For kerbing, channelling, &c., Derby-road, Ponder's End, for the Enfield Local Board. Mr. R. Collins, road-surveyor Court House, Enfield:—

Wady & Co.	£287 6 9	W. Griffiths	£240 0
Wm. Nicholls	265 0 0	E. J. Betts, Enfield Highway (accepted)	215 0 0
Langdon & Crawford	251 10 0		
J. Jackson	240 0 0		

LONDON.—For the erection of a block of school buildings (Whitehall-place Schools), Forest Gate, for the West Ham School Board. Messrs. J. T. Newman & Jacques, architects, 2, Fen-court, E.C. Quantities by Messrs. R. L. Curtis & Son:—

Stimpson & Co.	£18,850	Lorden & Son	£17,449
Hearle & Farrow	18,240	Gregar & Son	17,370
Maddison	18,113	G. Sharpe*	16,580
Reed & Son	17,686		

* Accepted subject to the approval of the Education Department.

LONDON.—For the execution of about 1,574 yards stoneware pipe sewer (18-in.); also 1,253 yards of 15-in. ditto; 120 yards C.I., pipe sewer, &c., for the Hendon Local Board. Mr. S. S. Grimley, Engineer, The Burroughs, Hendon, London, N.W.:—

H. Weldon	£5,729 0 9	W. Oldman	£4,600 0 0
J. Dickson	4,954 0 0	J. Jackson	4,480 6 8
T. Neave	4 946 19 4	R. Bullard, Ltd., Child's Hill, N.W.*	4,377 0 0
F. Dupont	4,747 15 9	J. Bloomfield	4,234 0 11
B. Cooke & Co.	4,728 0 0	J. Band	4,100 0 0
A. Kellett	4,666 1 9	* Accepted.	

LONDON.—For alterations at the "Olive Branch" Tavern, exclusive of glass, pewtering, and gas-fittings, Park-lane, Tottenham, for Mr. W. F. Baker. Mr. Horace M. Wakley, architect and surveyor, Albion Chambers, 11, Adam-street, Strand:—

W. Antil & Co.	£430	Edwards & Medway	£411
Gould & Brand	423	Sheffield Bros.	398

LONDON.—For re-decorating, gilding, &c. the Adelaide Gallery Restaurant, Strand, for Messrs. A. & S. Gatti. Mr. W. B. Pinkey, architect and surveyor, 8, King William-street, Strand:—

Frank Giles & Co.	£3,474	John Crossley	£1,355
J. Kinninmont & Sons	2 345	Campbell, Smith, & Co.	1,285
Jas. McJachlan & Sons	1,748		

LONDON.—Accepted for erecting a grand-stand in Northumberland Park, Tottenham, N., for the Tottenham Hotspur Football Club. Mr. A. Richards, architect, 18, Finsbury-circus, E.C.:—
Knight & Son, Tottenham £147 10 0

LONDON.—For alterations and additions to "The Wagon Horses," High-road, Tottenham, for Mr. W. Cox. Mr. J. E. Pinder, architect, High-road, Tottenham:—

Knight & Son	£320	Green & Smith	£288
Randall & Son	309		

LONDON.—For new Parochial Hall, St. Matthews, Bayswater, for the Rev. E. A. Stuart and the Churchwardens. Mr. E. P. Loftus Brock, F.S.A., architect:—

G. S. S. Williams & Son	£2,824	Barrett & Power	£2,325
Dove Bros.	2,455	J. P. Williams	2,240
B. E. Nightingale	2,395	J. Allen & Son*	2,150
Mattock Bros.	2,394	* Accepted.	

LONDON.—For alterations and additions to the "Devonshire Arms," Moreton-street, Pimlico, for Mr. W. C. Grinder. Mr. Dunn Carmichael, architect:—

T. Heath	£979	Jones, Richards, & Co.	£377
G. & F. Kent	954	J. Rees (accepted subject to modification)	791
S. & L. W. Ransom	910		

LONDON.—Accepted for underground ice-wells and other works at Ransome's Dock, Battersea, S.W., for Mr. A. Ransome. Mr. E. Woods, M.Inst.C.E., engineer:—
B. Cooke & Co., Battersea £2,400

LONDON.—For alterations and additions to the "Crown and Sceptre" public-house, Holland-road, W., for Messrs. Sutton, Carden, & Co., of the City of London Distillery, E.C. Mr. Edward Monson, architect, Acton Vale, W.:—

Thomas Nye	£1,099	J. Vears & Son	£829
George Lyford	1,080	Wm. Callingham, Kensington (accepted)	719
Chamberlen Bros.	1,050		
George Hooper	997		

LUTON.—For the supply and delivery of road material, for the Town Council. Mr. J. R. Roscoe, Surveyor:—

	Per cube yard.
Picked Flints.—George Powdrill	4 9 to 5 3
	Per ton.
Broken Slag.—Kettering Iron Co.	6 0
Broken Granite.—Enderby Granite Co.	13 1 to 10 4

MAESTEG (Wales).—For the erection of school buildings, Blaenllynfi, for the Cwmdu and Llangynwyd Higher School Board. Mr. E. W. Burnett, architect, Tondu, near Bridgend:—

Evan Evans	£3,972	D. Lloyd	£2,995
Rattary & Jenkins	3,673	P. Gaylard	2,85
W. Francis	3,535	Isaac Rees	2,596

NEWCASTLE-ON-TYNE.—For additions and alterations to two houses at Beverley-terrace, Cullercoats. Messrs. Badenoch & Bruce, architects, 21, Pilgrim-street, Newcastle-on-Tyne:—

Walter Baston	£1 269 9 0	John Ferguson*	£1,205 10
N. W. Maugham	1,230 3 5	James Douglass	1,190 7 4
		* Accepted on a reduced tender.	

NEWPORT.—For the erection of intermediate schools, Newport. Mr. B. Lawrence, architect, Newport:—

	According to specification.	If St. Julian's or Star brick used instead of Cattybrook.	If red deal dados are substituted for glazed brick dados.
D. Jenkins	£10,525 0 0	£10,466 0 0	£10,310 0 0
E. Fryatt Richards	9,369 19 0	9,345 0 0	9,300 0 0
J. H. Firbank	9,350 0 0	9,324 17 6	9,164 17 6
William Price	9,235 0 0	9,275 0 0	9,147 0 0
H. Parfitt	8,845 0 0	8,757 10 0	8,524 10 0
David Davies	8,805 0 0	8,730 0 0	8,482 0 0
A. E. Parfitt	8 800 0 0	8,750 0 0	8,500 0 0
John Jenkins	8,799 0 0	8,762 0 0	8,512 0 0
W. Blackburn	8,739 0 0	8 640 0 0	8,500 0 0
Dyson Parfitt	9,800 0 0	8,535 0 0	8,250 0 0
John Linton	8,462 0 0	8,320 0 0	8,200 0 0
Alfred Hazell	8,395 0 0	8,345 0 0	8,000 0 0
E. C. Jordan	8,349 0 0	8,274 0 0	8,117 0 0
G. Wilkins	8,388 0 0	8,238 0 0	8,122 0 0
W. Gradwell & Co.	7,991 0 0	7,940 15 0	7,821 0 0
C. H. Reed, Newport*	7,750 0 0	7,700 0 0	7,550 0 0
Architect's estimate	7,836 0 0	7,786 0 0	7,636 0 0

Accepted.

ST. GEORGE (near Bristol).—For elementary schools, Green, bank. Mr. F. Bligh Bond, architect, Liverpool Chambers, Bristol. Quantities by Mr. W. L. Bernard, St. Stephen's Chambers, Bristol :—

		Additional for slate roofs.
S. Williams	£12,666	£132 18 6
C. A. Hayes	11,677	95 0 0
H. A. Forse	11,490	266 0 0
J. E. Davis	11,434	180 0 0
W. Cowlin	11,440	150 0 0
E. Lowe	10,998	153 0 0
J. Perrott	10,934	184 0 0
E. Walters	10,930	175 0 0
G. H. Wilkins	10,840	110 0 0
R. Wilkins & Son	10,723	183 0 0
G. Humphreys	10,279	179 0 0
W. Field & Son	9,847	277 1 6
F. Martin *	9,044	254 0 6

* Accepted with addition of slate roofs.

SEAFORD (Sussex).—For the construction of 1,000 yards of 12-in. and 9-in. pipe-sewers, &c., for the Local Board. Mr. B. A. Miller, C.E., Surveyor, Town Hall, Seaford :—

Steer	£600	G. Bell	£599
Berry	683	W. & H. Saunders & Co. Bournemouth (accepted)	539
Piper	630		
Fry, Bros.	610		

SOUTHAMPTON.—For converting No. 14. Waterloo-place, into business premises, for Mr. R. W. Jesson. Mr. William Burrough Hill, F.S.I., architect, Southampton :—

Playfair & Toole	£524
J. J. Udall & Co., Southampton (accepted)	444
Henry Cawte	432

SOUTHAMPTON.—For alterations and additions to No. 104, St. Mary's-street, for Mr. R. Allen. Mr. William Burrough Hill, F.S.I., architect, Southampton :—

Playfair & Toole	£644 0 0	W. H. Neale	£607 7 9
J. J. Udall & Co.	624 0 0	A. Wheeler, Lymington *	549 10 0
Henry Cawte	609 0 0		

* Accepted.

STOW-ON-THE-WOLD.—For supplying and laying about 5,500 yds. pipe sewers, with manholes, &c., for the Rural Sanitary Authority. Mr. G. B. Witts, C.E., Hill House, Leckhampton, near Cheltenham :—

Sewerage.

W. Lee	£3,169 16 8	D. H. Porter	£2,058 3 0
George Campin	2,538 3 3	W. H. Saunders & Co.	2,034 14 10
Henry Hill	2,321 19 5	Mark Williams	1,968 18 5
John White, jun.	2,174 18 0	H. & C. Burden	1,951 11 8
Stephen Ambrose	2,153 5 5	J. H. Firbank, Maindee, Newport, Mon. *	1,926 17 6
Herbert Weldon	2,144 9 9	T. J. Davies	1,916 12 4
Johnson Bros.	2,111 9 4		
Sanitary & Œconomic Association, Ltd.	2,110 15 1		
J. & G. Howman	2,072 4 5		

Fencing.

Sanitary & Œconomic Association, Ltd.	£289 9 0	W. Lee	£57 3 0
John White, jun.	98 0 9	T. Walker	57 3 0
J. H. Firbank	72 11 0	Rowland Bros.	53 11 0
Mark Williams	67 8 4	R. E. & C. Marshall	53 6 0
D. H. Porter	64 17 0	Herbert Weldon	53 6 0
J. & G. Howman	64 17 0	T. W. Palmer & Co.	52 0 4
Stephen Ambrose	61 0 0	Johnson Bros.	49 9 0
T. J. Davies	59 14 4	Hill & Smith, Brierley Hill (Staff.) *	48 3 4
Economic Fencing Co.	57 8 0	H. & C. Burden †	37 18 0

* Accepted. † Withdrawn.

WALSALL.—Accepted for the execution of sewerage works, Littleton-street, &c., for the Corporation. Mr. R. H. Middleton, Borough Surveyor, Walsall. Quantities by Surveyor :—

Sewering in Littleton-street, W.

James Atkins, Walsall £79 17 6

Sewering, &c., in Church-street, Bloxwich.

James Atkins, Walsall £273 0 0

WALSALL.—Accepted for alterations, &c., to police-station, Goodall-street, for the Corporation. Mr. Richard Henry Middleton, architect. Quantities by architect :—

Ralph Merton Hughes, Birmingham £1,281

WESTON-SUPER-MARE.—For the erection of shop, house, &c., Worle, for Mr. Greenwood. Mr. P. J. Wilde, architect, Boulevard Chambers, Weston-super-Mare :—

C. Addicott	£895 10 0	G. Sprake (accepted)	£650 0 0
W. M. Dubin	890 0 0	Oscar Witcombe	573 13 6

[All of Weston-super-Mare.]

WITHAM.—Accepted for alterations and additions to Witham National Schools, Witham, Essex. Mr. F. Whitmore, architect, Chelmsford :—

Gamble, Richards, & Lewis, Witham £617

WITHAM.—For alterations and additions to British Schools, Witham, Essex. Mr. F. Whitmore, architect, Chelmsford :—

Ernest West	£496
Smith & Son, Witham (accepted)	475

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"THE BUILDER" is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 19s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to DOUGLAS FOURDRINIER) should be addressed to the publisher of "THE BUILDER," No. 46, Catherine-street, W.C.

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H. & W.—J. L.—T. B.—J. S.—H. C. (amounts should have been stated).—O. W.—"Student" (consult a pocket-book of engineering formulæ. There are plenty to be had).—J. T. Sons & S. C. (too late for this week).

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READING CASES, { NINEPENCE EACH. By Post (carefully packed) 1s.

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SLATE MERCHANT,

SLATER and TILER.

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Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.

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COLLINGE'S PATENT HINGES,

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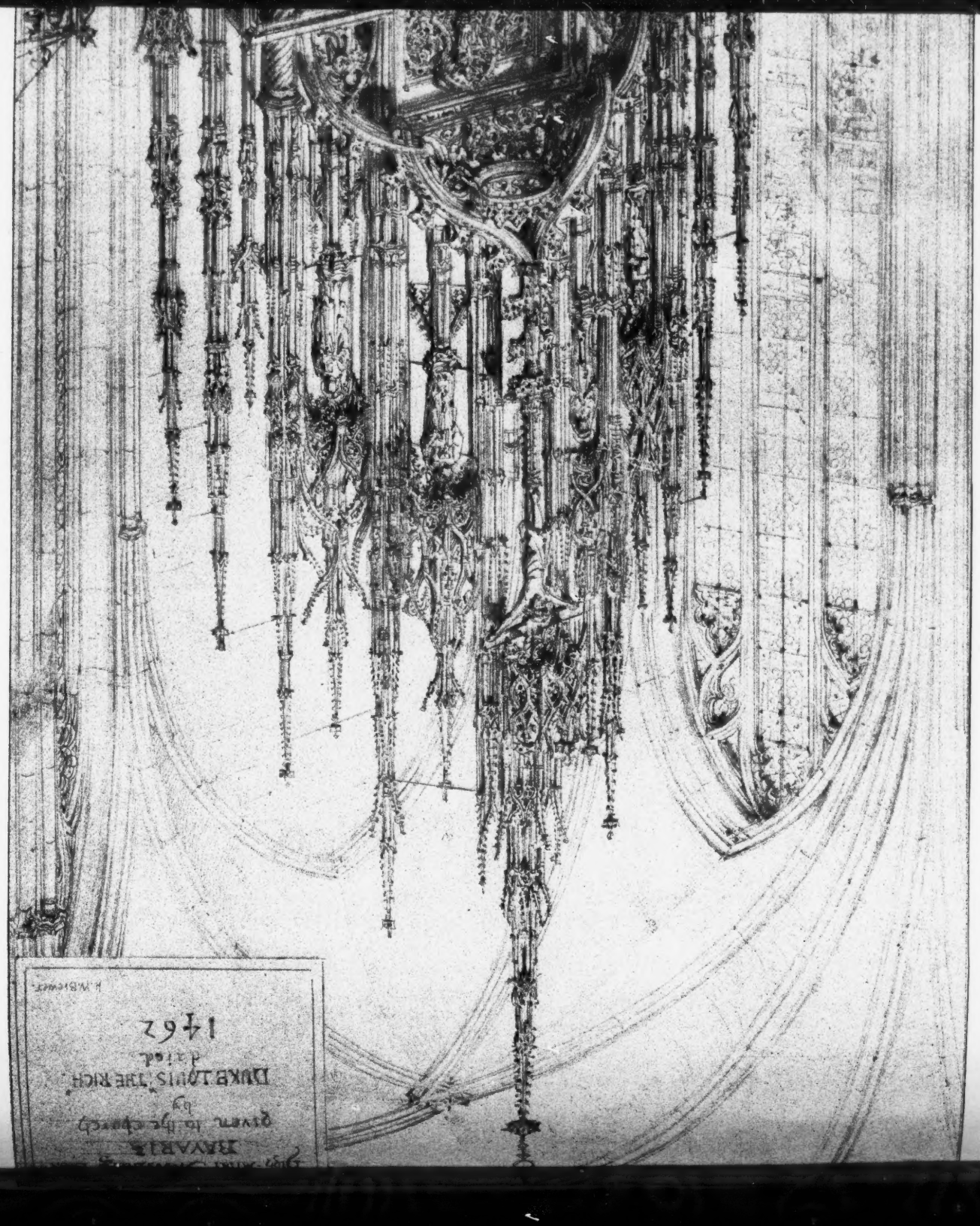
LIVERPOOL: 6 and 8, HATTON GARDEN.

GLASGOW: 47 and 49, ST. ENOCH-SQUARE.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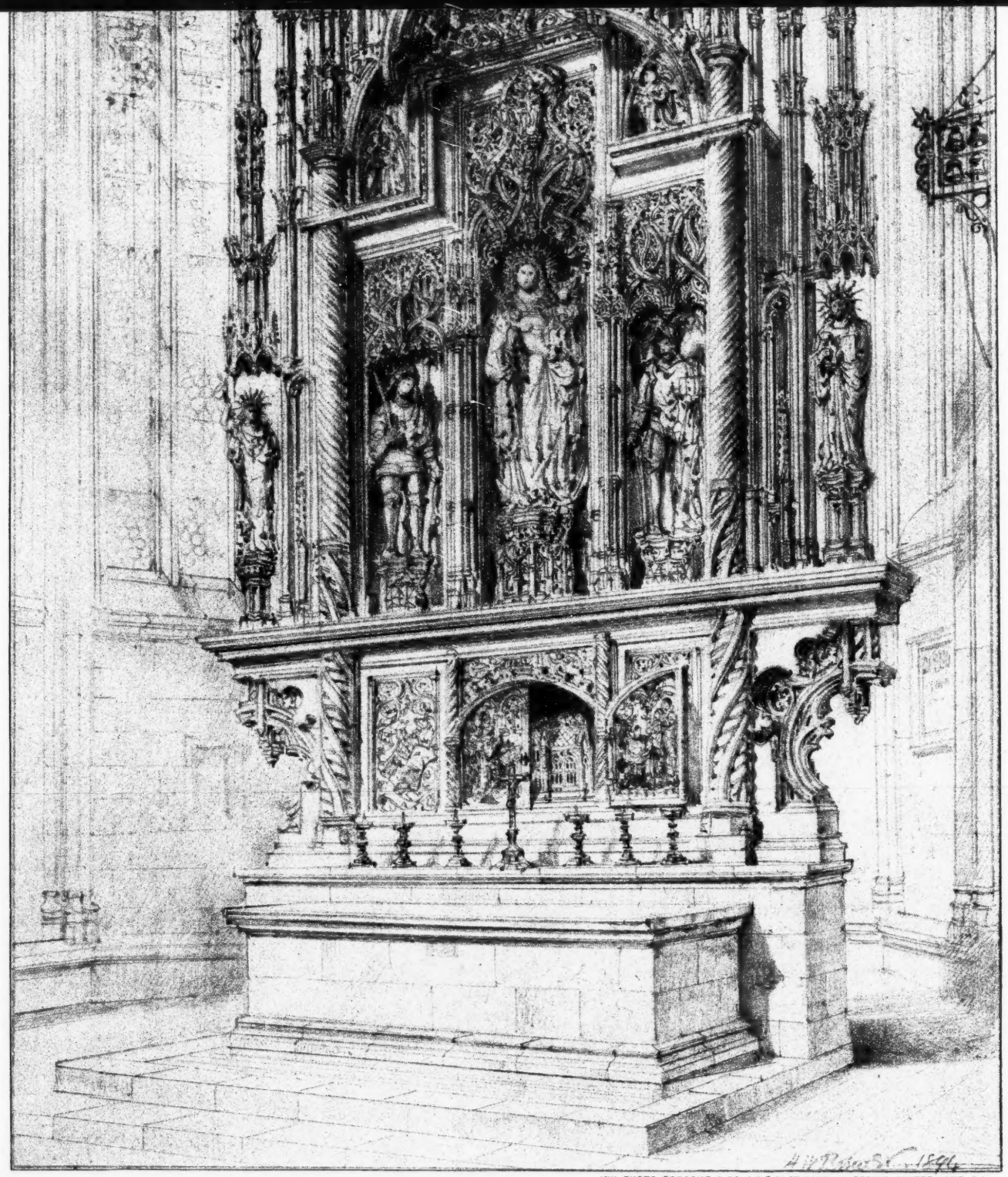
1462



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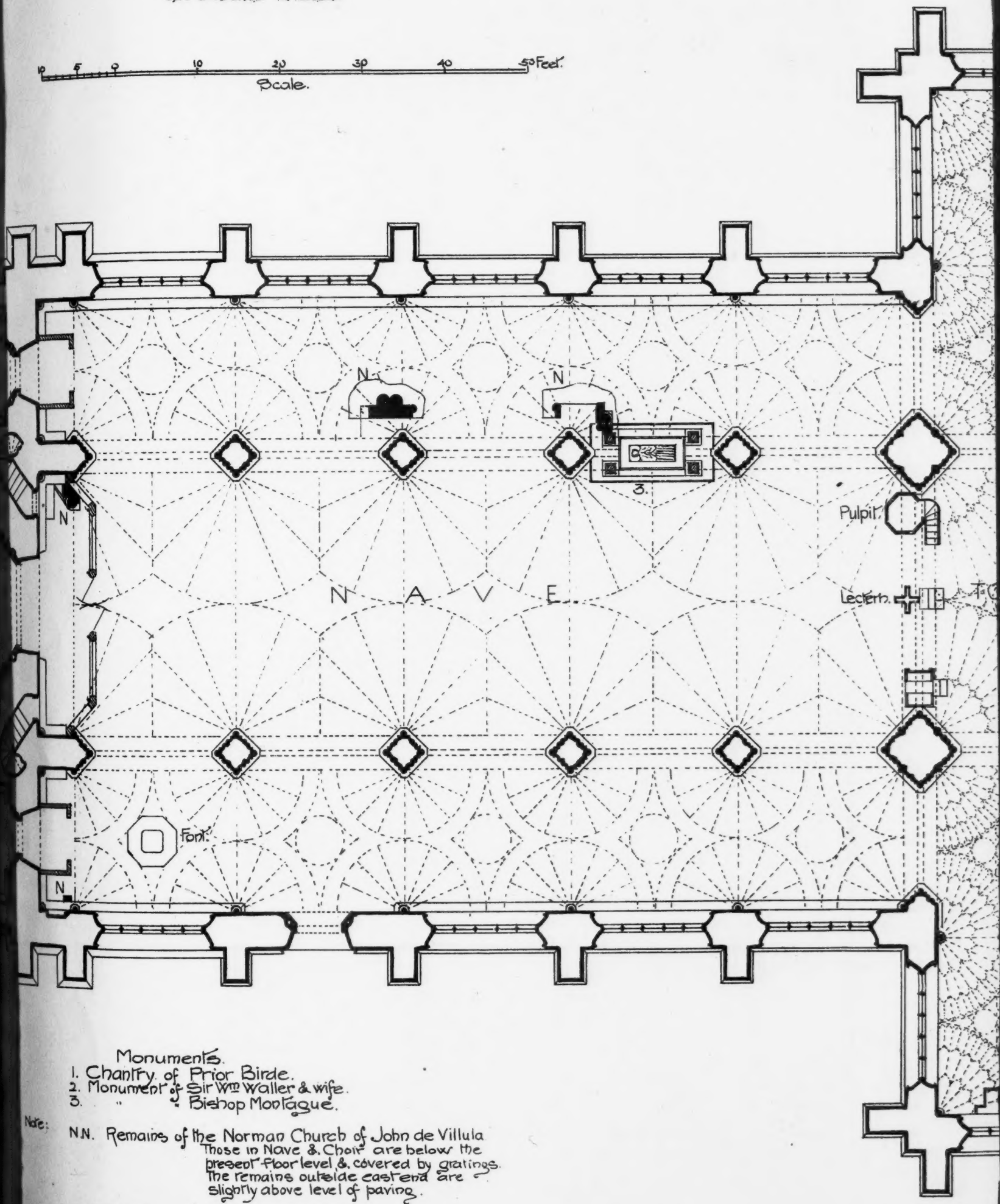
HIGH ALTAR, MOOSBURG, BAVARIA.—Drawn by Mr. H. W. Brewer.

Royal Academy Exhibition, 1894.

BATH ABBEY CHURCH.

Ground-Plan.

10 5 0 10 20 30 40 50 Feet.
Scale.

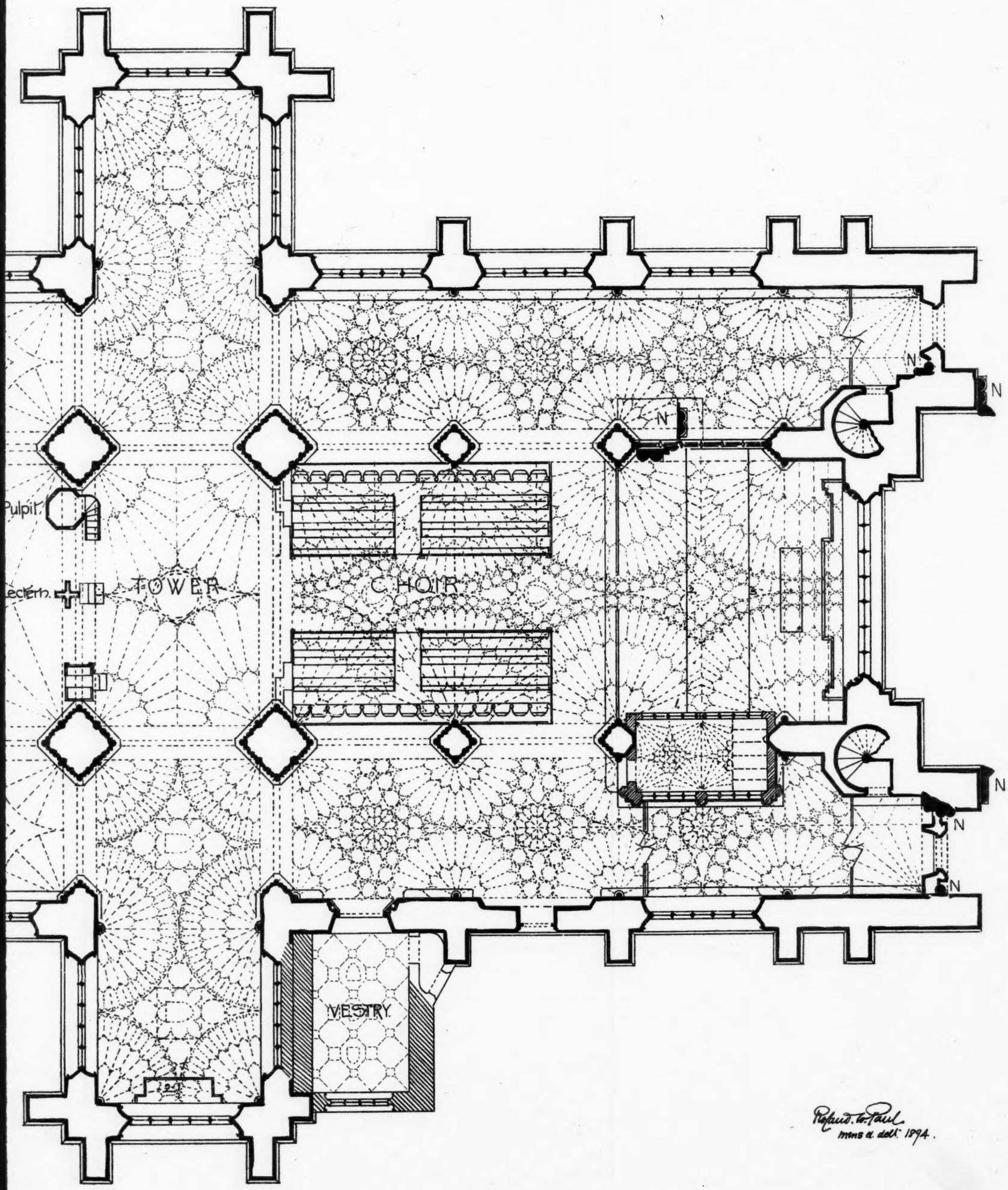


Monuments.

1. Chantry of Prior Birde.
2. Monument of Sir Wm Waller & wife.
3. " " Bishop Montague.

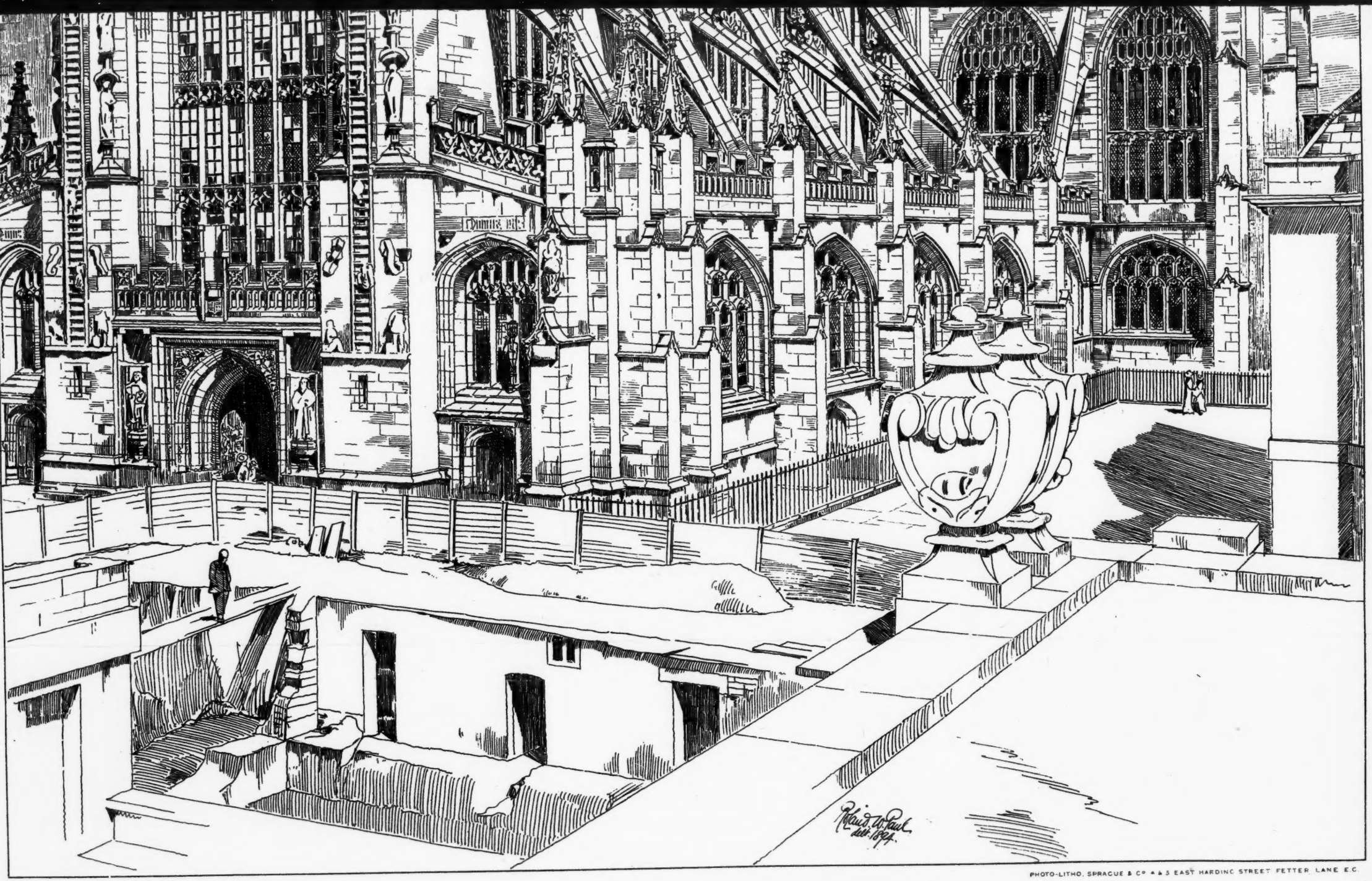
Note: N.N. Remains of the Norman Church of John de Villula
Those in Nave & Choir are below the present floor level, & covered by gratings. The remains outside eastend are slightly above level of paving.

The vaulting of Nave & its aisles has been copied from the ancient vaulting of Choir & formed part of Sir G.G. Scott's restoration.



Richard Paul
mens et dell. 1894.

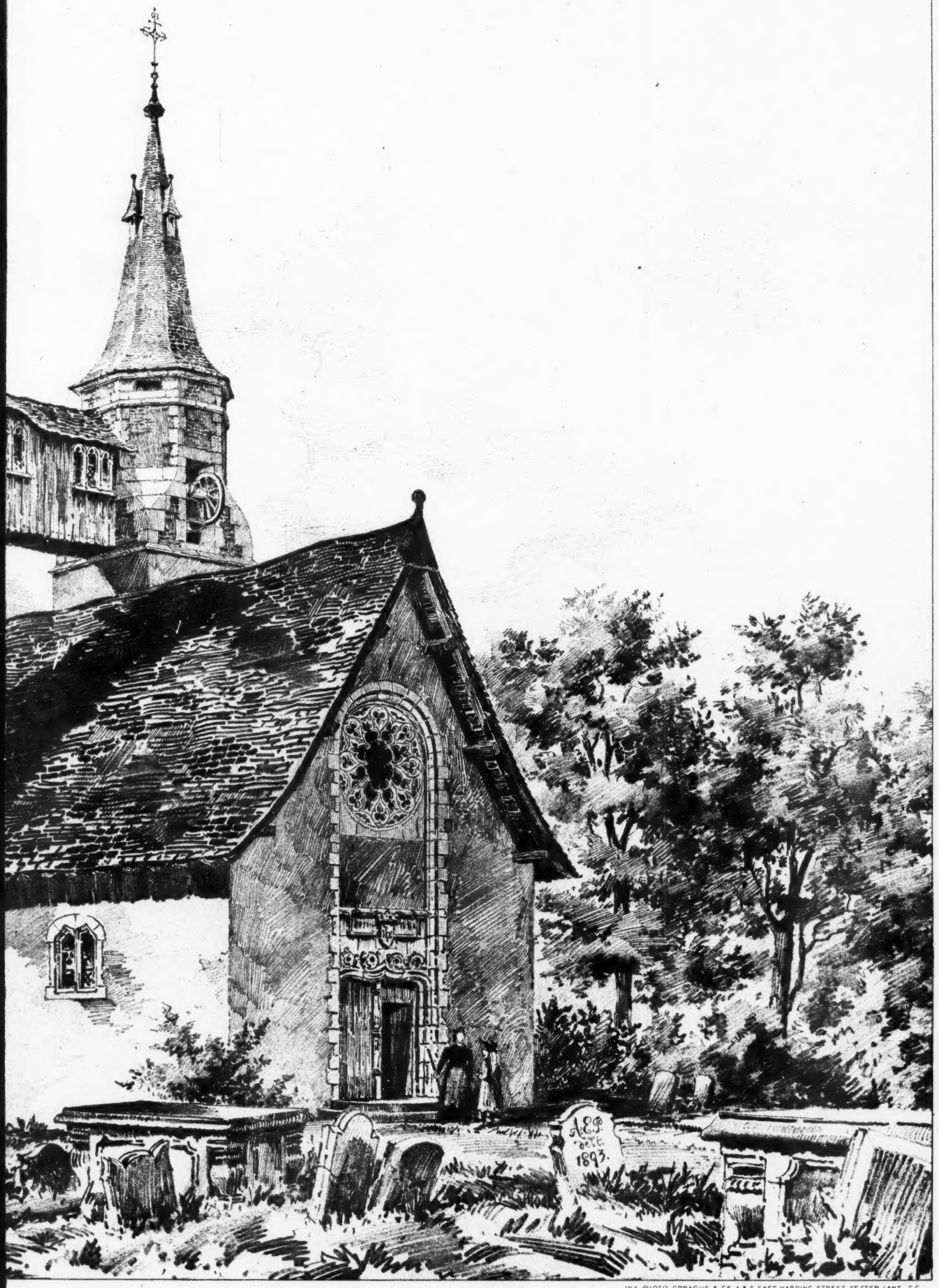
PHOTO-LITHO. SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE E.C.



THE ABBEYS OF GREAT BRITAIN.—No. 6. BATH: FROM THE SOUTH-WEST.

Drawn by Mr. Roland W. Paul.

DESIGN FOR A VILLAGE CHURCH.—By



INK PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE E.C.

AGE CHURCH.—By Mr. F. C. Eden.